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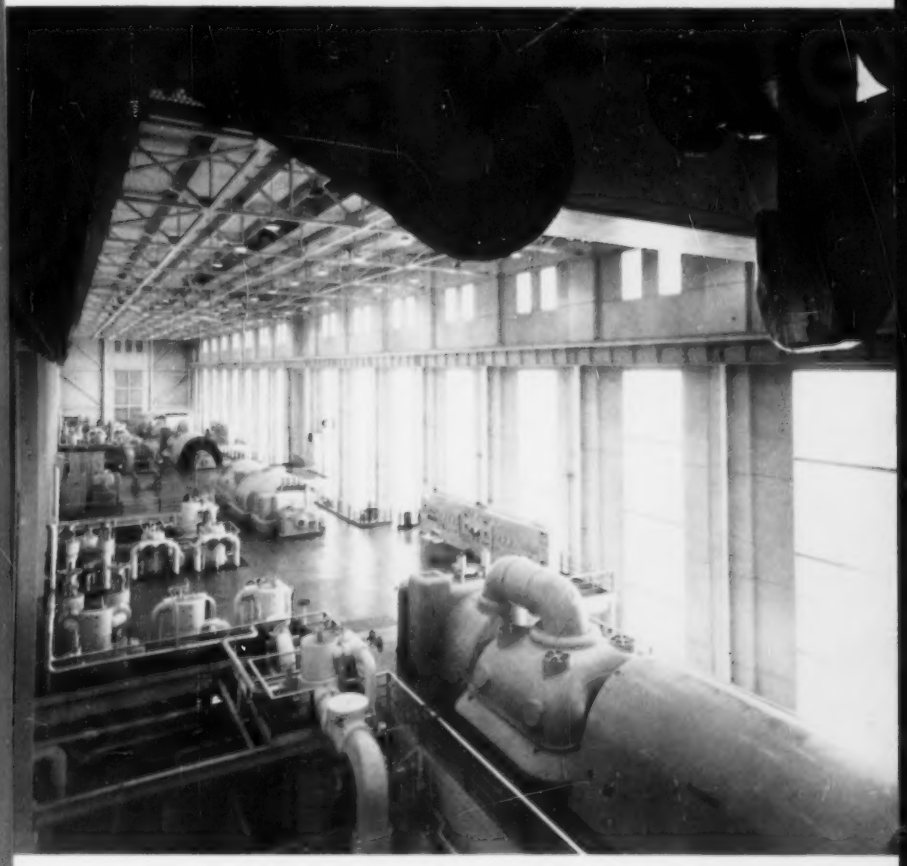
Keep Housepower Working... 118

ELECTRICAL WEST

January 1957
25 Cents

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.



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Edison
is selling the
advantages
of electric drying...
to speed up
your
electric dryer
sales

SHOW THIS TO YOUR HUSBAND!

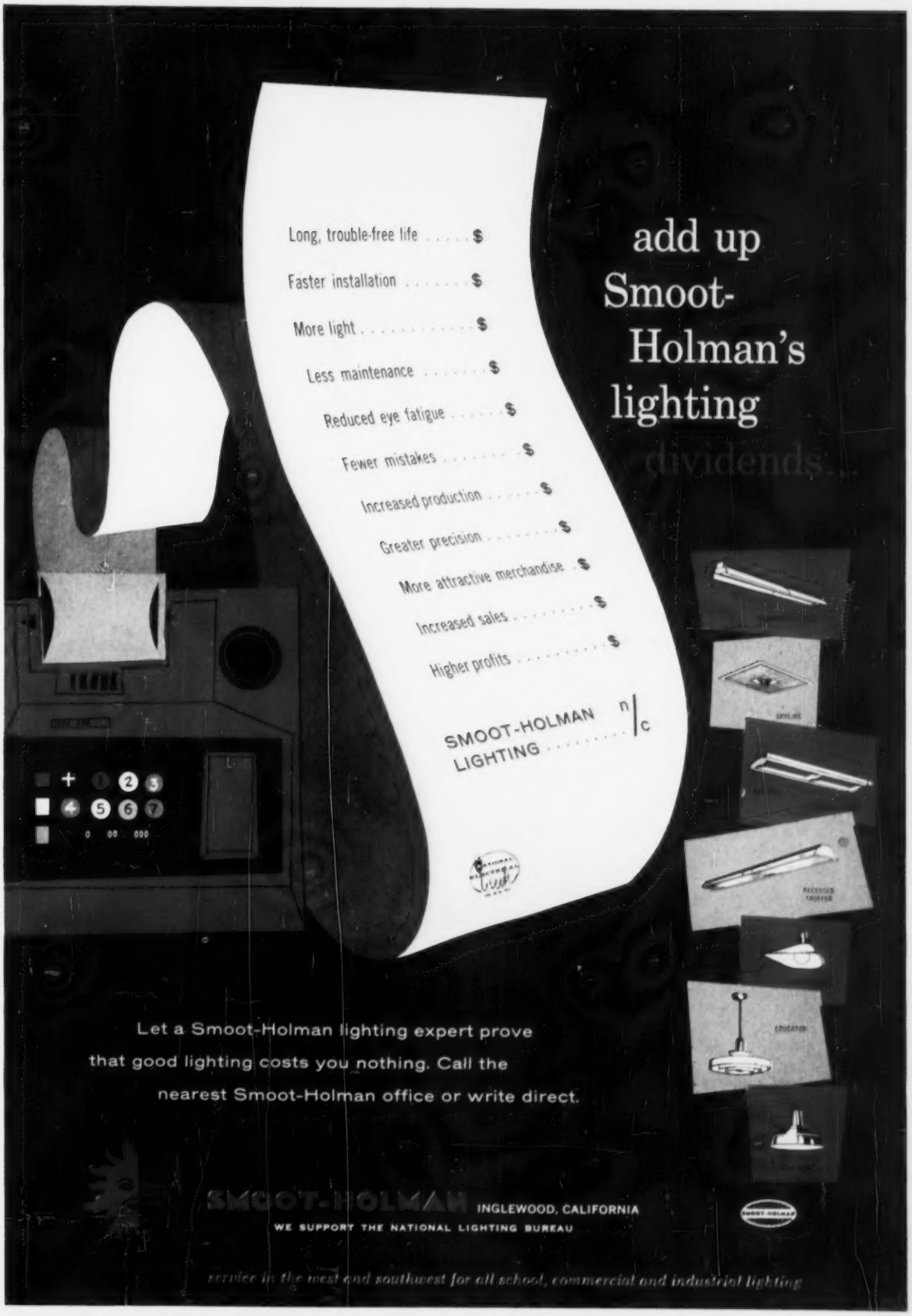
Tell him it's you without an electric clothes dryer — tenderly protecting your nice clean (and still wet) wash because you got no cooperation from the weatherman.

Tell him the cure: a shiny new electric dryer. It saves you the lifting and bending and dependence on the weather. It saves clothes — they dry fluffier, cleaner and fresher smelling. They last longer, too.

Tell him it has to be an *electric* dryer, of course. Because it's so safe. Because you simply plug it in. And because it costs less to buy! (Electricity is your biggest bargain in modern living.)

SOUTHERN CALIFORNIA Edison COMPANY

LIVE BETTER—ELECTRICALLY


Long, trouble-free life . . . . . $
Faster installation . . . . . $
More light . . . . . $
Less maintenance . . . . . $
Reduced eye fatigue . . . . . $
Fewer mistakes . . . . . $
Increased production . . . . . $
Greater precision . . . . . $
More attractive merchandise . $
Increased sales . . . . . $
Higher profits . . . . . $
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add up Smoot-Holman's lighting dividends...
Let a Smoot-Holman lighting expert prove that good lighting costs you nothing. Call the nearest Smoot-Holman office or write direct.
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WE SUPPORT THE NATIONAL LIGHTING BUREAU
service in the west and southwest for all school, commercial and industrial lighting

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

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Next Month

February, the annual construction and statistical issue, will review 1956 construction and 1957 budgets for system additions and improvements. It will also carry Far West and national statistics and the calendar of new generation. Utility sales accomplishments for 1956 will be carried in the March issue, in order to give complete reports. How 1957 business development plans are shaping up is told in this issue.

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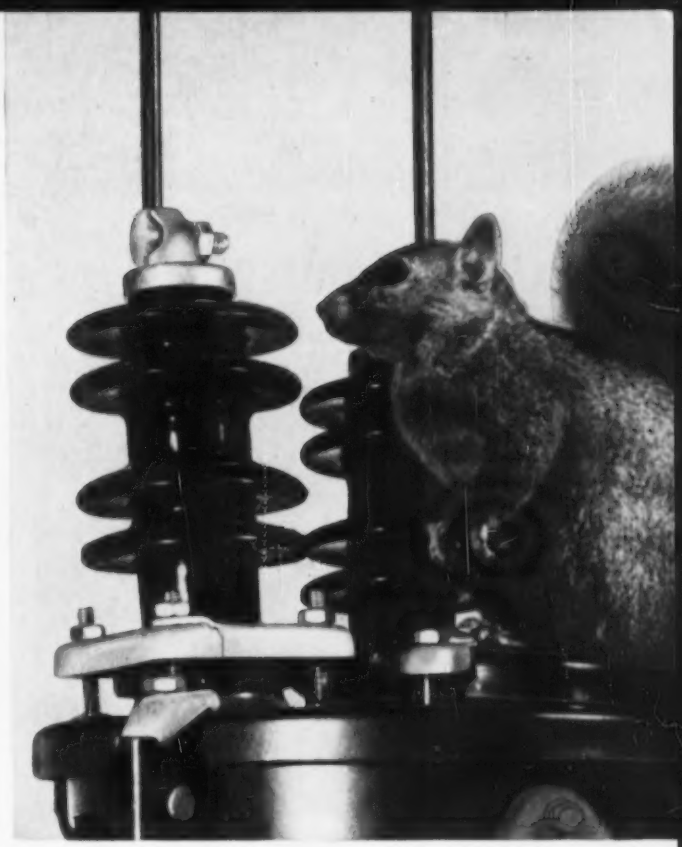
Nut Bites Squirrel... Costs Utility $3000



You'll never believe it—we didn't either, but it actually happened! A curious squirrel evidently took a bite of the nut on the connector on top of a 7620-volt transformer—with the inevitable result. The nut bit back!

The squirrel's flaming body dropped into the dry grass below, which caught fire and in turn set the pole ablaze. Eventually the pole burned through, dropping primary wires onto the secondaries below.

Result: the pole had to be replaced—and so did some 30 television picture tubes in customers' homes. The whole deal was embarrassing and costly to the utility company—and to the squirrel's family also, which probably still has never satisfactorily explained to the neighbors what happened to Pappy.

It Can't Happen Here... on L-M's New Bite-Proof Transformer Bushing

This new bushing is designed to take the tap vertically, conforming to EEI-NEMA standards. Not only does it have a hand-tightening knob (which can't be spun off—but can be intentionally removed) but also it has a phenolic cap which covers the terminals completely. No hot nuts or other live parts are accessible.

If you use bare wire jumpers, we suggest a neoprene sleeve, as shown. The phenolic cap is constructed so as to provide adequate drainage.

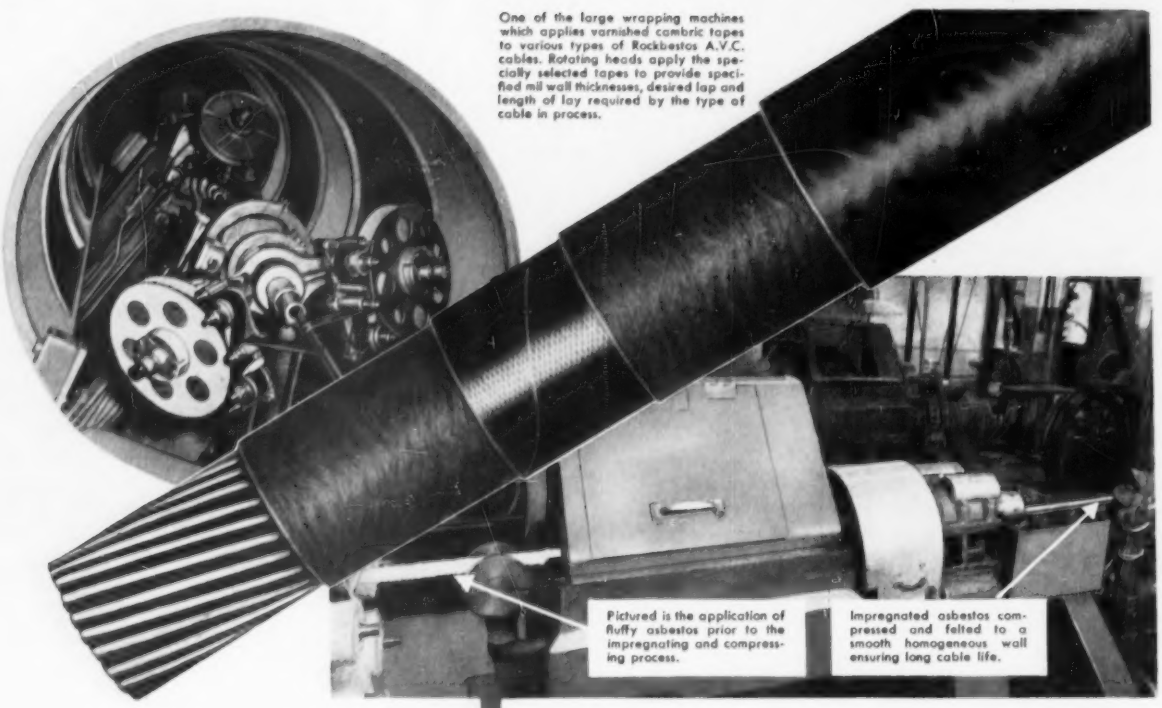
On protected transformers a 3/16-inch slot is provided for the lightning arrester terminal. Nothing except the most persistent hummingbird sitting on the arrester could reach the hot terminal—and that's pretty unlikely.

This new bushing is representative of the many plus features found only in L-M Round-Wound Transformers®—and another reason why you should order more L-M Round-Wounds. Ask the L-M Field Engineer to tell you other reasons for buying these outstanding and highly efficient transformers. Or write Line Material Co., Transformer Div., Zanesville, Ohio.

284

LM® **LINE MATERIAL** *Transformers*

A McGRAW ELECTRIC COMPANY DIVISION



One of the large wrapping machines which applies varnished cambric tapes to various types of Rockbestos A.V.C. cables. Rotating heads apply the specially selected tapes to provide specified mil wall thicknesses, desired lap and length of lay required by the type of cable in process.

Pictured is the application of fluffy asbestos prior to the impregnating and compressing process.

Impregnated asbestos compressed and felted to a smooth homogeneous wall ensuring long cable life.

Quality Varnished Cambric Tapes

+

felted asbestos walls impregnated with selected compounds add up to long life Rockbestos A.V.C. (N.E.C. Type AVA)

Made to Rockbestos' exacting specifications which incorporate standards beyond those called for by industry, Rockbestos varnished cambric tapes assure you of these plus values:

- ★ **A special surface treatment which insures that the tape will wrap properly, providing uniform dielectric strength and good bending characteristics in the completed cable.**
- ★ **Special surface hardness tests which mean varnish film that will not become damaged in processing or handling.**
- ★ **Rigid tape thickness requirements which give you uniformity of cable diameters.**
- ★ **Add to this thirty years of know-how in the application of VC tapes for high temperature application on Rockbestos A.V.C. cables and you have A.V.C. cable that insures trouble-free operation and long life.**

In the Rockbestos A.V.C. construction dense, felted asbestos walls, impregnated with selected compounds, seal the quality VC tapes away from air and moisture . . . give added strength against damage and flexing.

The result . . . you get long life and dependable service under every type of operating condition . . . in temperatures up to 230°F.

Complete construction and test specifications of Rockbestos A.V.C. are in the new booklet "Specifications RSS-88." Write today for your Free copy.

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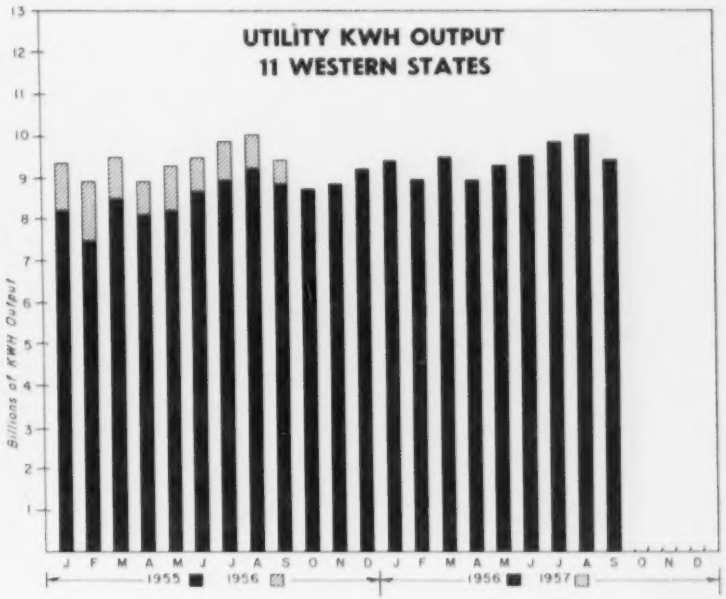
How're We Doing?



Output Comparisons

Year-to-year Kwh Output Changes in Western Regions and U. S.
Per Cent Changes Over Same Week One Year Ago

Week Ending	Rocky Mountain	Pacific Southwest	Pacific Northwest	U. S. Total
Nov. 3	+9.5	+8.0	+12.7	+5.8
Nov. 10	+8.2	+6.9	+ 9.5	+5.9
Nov. 17	+3.7	+4.6	— 3.7	+3.9
Nov. 24	+7.1	+8.0	+ 5.2	+6.6
Dec. 1	+7.4	+8.1	+ 9.1	+6.3

Customers

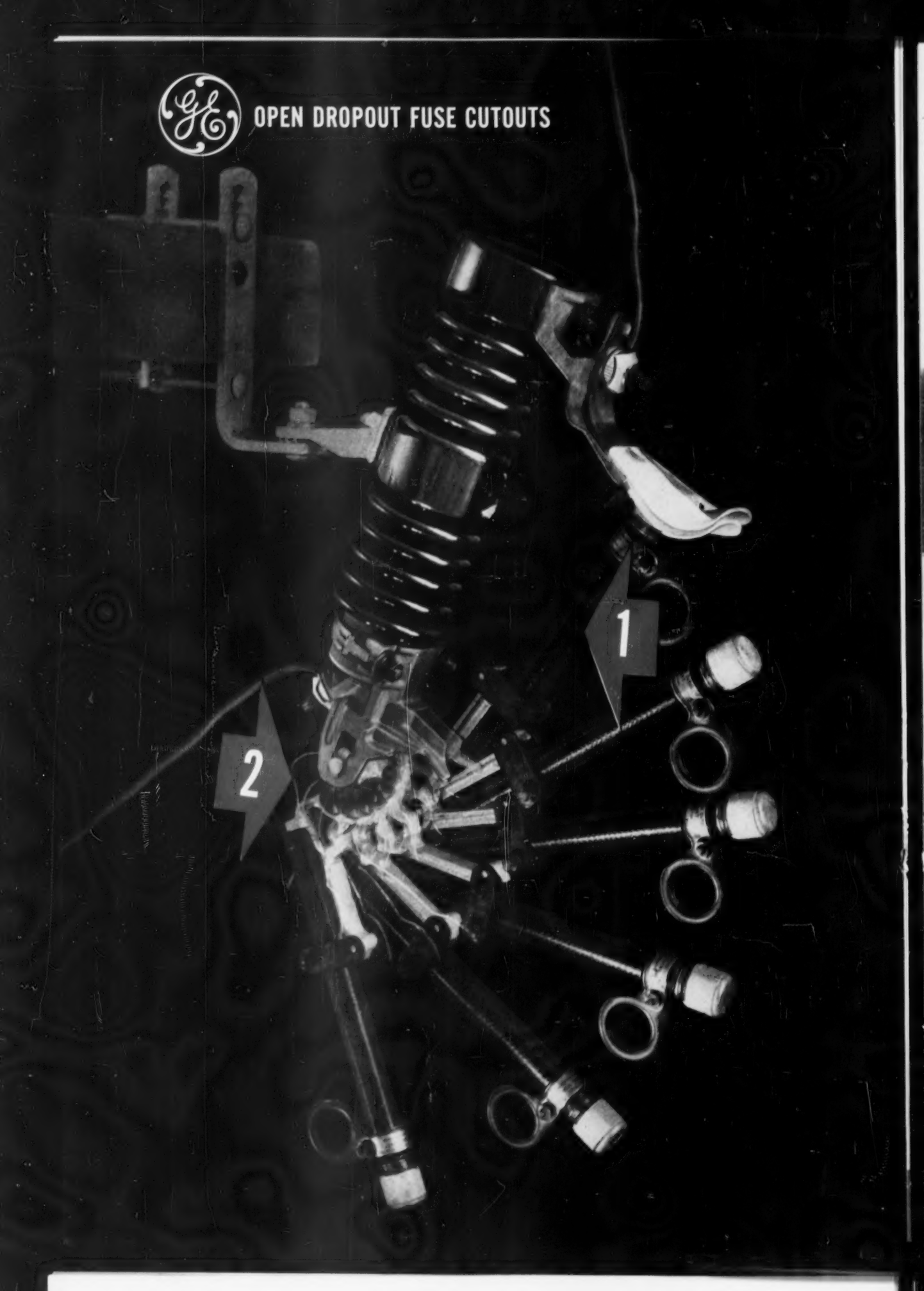
As of Sept. 30, total customers in the Western U. S. totaled 8,154,861, up 304,227 for the past 12-month period. Residential customers account for 6,789,277 of the total and 270,642 of the increase. Residential kwh sales are 23.2% of total sales in the West.

Earning Reports

Company	Net Income (12 Months to 10/31/56)	Earnings Per Common Share	Earnings Previous Period
San Diego Gas & Electric Co.	$6,926,353	$1.50	$1.11
Portland General Electric Co.	5,036,621	1.68	1.64
California Pacific Utilities Co.	736,739	2.24	2.20
	(First 9 Months 1956)		
Seattle City Light	4,607,119*	....	....
Idaho Power Co.	4,342,373	1.64	1.37

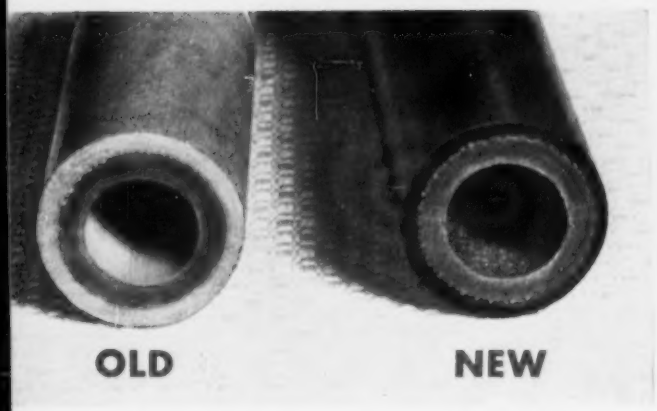
* An increase of $402,954 over same period 1955.

OPEN DROPOUT FUSE CUTOUTS

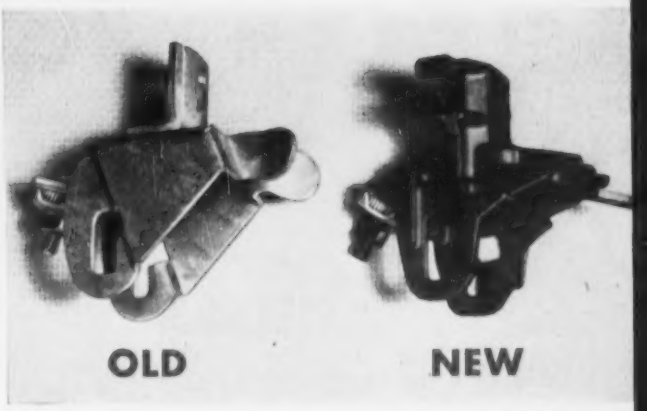


Now—even longer service life from General Electric Open Dropout Fuse Cutouts with

New Polyester Fuse Tube... New Bronze Fittings...



1 **COMPARISON OF OLD AND NEW FUSE TUBES** shows increased thickness of fiber is made possible by a new, thinner but tougher sheath of fiberglass reinforced plastics. More fiber lengthens tube life by allowing greater number of cutout operations with increased reliability.



2 **NEW CORROSION-RESISTANT BRONZE HINGE** (right) has dependable characteristics of old-type galvanized hinge, plus positive operation after years of service in corrosive atmospheres. Fuse-holder drops immediately when fuse blows, slams back easily after re-fusing.

General Electric's new Open Fuse Cutout gives you these important changes that assure even better performance, longer service life and mean fewer problems for linemen.

New fuse tube now features a tough outer protective sheath of reinforced polyester resin. It is practically immune from the effects of weather and age. Improved characteristics and greater strength of this new material permit a thinner sheath, allowing greater thickness of fiber to be used in the fuse tube. As a result, ***these new tubes stand up longer under repeated operations.***

New lower hinge of improved design, together with all component parts, is now made entirely of bronze, virtually ending corrosion problems encountered with galvanized fittings. Hinge won't stick—operates freely after years of exposure even in salt air and other corrosive atmospheres.

Other features include new hanger support construction, compression-clamped fittings, permanent high-pressure contact and latch, long lasting silver-plated contacts, complete bird-proof construction, optional load-break device and disconnect blade.

Heavy-duty ratings include a 15-kv, 100-ampere cutout with an interrupting rating of 4000 amperes and a 7.8-kv, 100-ampere unit with a 5000-ampere interrupting rating.

For complete information, contact your nearest G-E Sales Representative, or write to General Electric Company, Section 433-20, Schenectady 5, New York.

LIVE BETTER ELECTRICALLY

Progress Is Our Most Important Product

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

Power Roundup

SIGNIFICANT ITEMS FROM THE EDITORS' NOTEBOOKS

A BIG QUESTION — Republicans, analyzing November election results, cannot ignore the victory of Democrats who are also opponents of the Eisenhower partnership power policy. The big question in the minds of most of us in the Western electrical industry is: Will partnership be scrapped to gain political approval of the people who sent Wayne Morse and his fellow travelers back to Congress?

There may be two clues to the answer in the near future.

First hint could be in the President's "State of the Union" message this month, but the odds are that a firm decision will not be made public with a statement—it will probably be in the form of action.

For a more concrete "test," we recommend that you observe the action around the Bureau of Reclamation's report on Pacific Gas and Electric's partnership proposal on California's Trinity River project.

PG and E has offered to build power generation facilities and pay the government for falling water. Congress authorized the project last session, but held power aspects in abeyance while the Interior Department negotiated with nonfederal interests for sale of the falling water.

Deadline for the bureau's report is February.

—EW—

NEW APPROACH—The Washington grapevine hints that the Interior Department is reconsidering its decision on the Pleasant Valley dam site on the Snake River.

Now proposed is a federally constructed high dam that would drown out the controversial Hells Canyon project, now under FPC license to Idaho Power.

The latter company's Oxbow and Brownlee projects upstream from Pleasant Valley would be unaffected as would the Mountain Sheep project of the Pacific Northwest Power Co., downstream from the Pleasant Valley site.

Admiral Ben Moreell (of Hoover Commission fame), chairman of the board of Jones & Laughlin Steel Corp., said in San Francisco that America has traveled one-third of the way to Karl Marx's socialist goal of "abolishing all private property by transferring its control to the bureaucracy."

—EW—

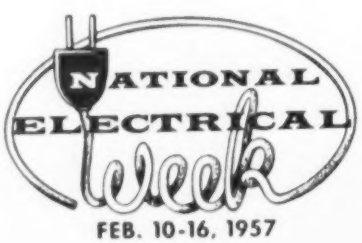
Roundup congratulates Donald Kroeker, Portland, who is one of five members of the American Society of Heating & Air Conditioning Engineers in the nation to be designated Fellow. He designed the two largest U. S. installations using reverse-cycle refrigeration for heating. This is the first time the society has bestowed the honor.

—EW—

SUCCESS—At the risk of harping too long on partnership development, Roundup would like to call attention to a brief report on the Bonneville Power Administration annual forecast in the news section this month.

Briefing the brief even more, it says that the anticipated 1961-62 power shortage in the Pacific Northwest has been rolled back to 1964-65. Basic reason for this gain is that partnership has encouraged local utilities to schedule about six times more generation construction than a year ago.

—EW—



HIGHWAY HIGHLIGHTS — McGraw-Hill Economist Dexter Keezer translated the Federal Highway Act of 1956 into some imaginative comparisons in a recent talk before the American Petroleum Institute.

Scheduled are 41,000 miles of interstate highways to be constructed over a 13-year period plus substantial additions and improvements to the primary and secondary road nets of the country, all of which is estimated to cost between $80 billion and $100 billion. To do this would require 500 conical piles of crushed stone, each equal to the size of the largest Egyptian pyramid, which is four city blocks square and 40 stories high. By the fifth year of the program, the new road-building machines required would make a solid line all the way from Chicago to Boston. Cement requirements are estimated to be 1.4 billion barrels.

Ironically, the 92,000,000 vehicles expected to be on U. S. highways by 1971 could not be parked end to end on the 41,000-mile interstate system. There just wouldn't be enough room.

—EW—

Recommended reading — The *Dennis the Menace on Safety* booklet published by the National Safety Council and distributed by several utility companies' safety councils.

—EW—

COINCIDENCE—Herbert A. Leggett sends us *Arizona Progress*, an interesting and entertaining publication that he edits for the Valley National Bank in Phoenix. In the last issue he wrote:

"With some 40,000,000 receiving sets in the United States most of our population is now exposed to the TV fallout. There is no escape from escapism."

In the same mail with *Arizona Progress* was a statement by Frank Mansfield, Sylvania's director of marketing

ABOUT THE FINER POINTS OF METERING:

This typical test station in Florida exposes Sangamo J2 Meters to salt vapor atmospheres as part of Sangamo's continuous program of improvement.

Field tests prove corrosive atmospheres can't hurt J2 Meters

Longer meter life—even under the worst possible service conditions—is the subject of constant study and research at Sangamo.

The findings of continuous field tests since 1952 at salt atmosphere test stations on the coasts of California—Texas—Florida . . . corrosive industrial atmosphere stations in chemical industry areas, are the basis of the corrosion-resistant design of the J2.

All external and internal meter parts are given complete protection against all conditions of outdoor exposure. The use of rust inhibitors, oxide films, inorganic seals and special plating on all metal parts and the inert organic Selkyd meter base assure many years of maintenance-free service under the toughest conditions.

And remember, the J2 Meter is the *slow speed* meter—only 10 revolutions per minute at full nameplate rating—another reason why the J2 is your best investment in a watthour meter.

Live Better Electrically

SANGAMO ELECTRIC COMPANY

SPRINGFIELD, ILLINOIS

JM56-7

FAST, LOW-COST WAY TO INSTALL PIPE . . .

push it under streets, roads, tracks, lawns with a timesaving

GREENLEE HYDRAULIC PUSHER

Speed underground piping jobs this way. GREENLEE Pusher is one-man-operated (by hand or with power pump), portable, simple to set up and use. No tearing up of pavement, floors, lawns . . . does away with extensive ditching, tunneling, backfilling, repaving. GREENLEE Pusher cuts job time to a fraction . . . often pays for itself on first job.

Two feet per minute average pushing time

GREENLEE Pushers are available in two sizes: No. 790 for ¾" to 4" pipe . . . No. 795 for pipe over 4", concrete sewer pipe, large ducts. Average performance of No. 790, shown above with power pump, two feet per minute. Write for literature.

GREENLEE

GREENLEE TOOL CO.

1761 Columbia Avenue • Rockford, Illinois

research, that " . . . by 1966 there will be approximately 74,000,000 sets in use."

Will someone else gently break the news to Mr. Leggett? We can't stand to see a man cry.

—EW—

After five years of investigation, Monsanto Chemical Co. announces that organic materials are favorable reactor coolant-moderators.

—EW—

MEASUREMENT METHOD — A fishing pole is an important part of a new method of measuring stream flow developed by California Research Corp.

A Geiger counter is attached to the pole and dropped into the water. Upstream from the Geiger counter a radioactive isotope is also placed in the water. The counter measures the amount of tracer material passing by, and from there on it's easy to figure the amount of water per hour the stream carries.

No, the test doesn't require enough radioactive material to pollute the water.

—EW—

Heating all of the 34,000,000 American homes would require 700 billion kwh with resistance heating, but only 200 billion with the heat pump.

—EW—

ALUMINUM COATING — Aluminum coatings are now being applied to various products, including pole line hardware, manufactured by Bethlehem Steel Co.

Bethlehem developed the coating process after aluminum established itself as being superior to galvanizing in resisting corrosion.

The company reports good results from a new technique to apply the aluminum coating to threaded work.

—EW—

EJC reports that drafted engineers who have not been assigned with regard to their specialty may receive help by presenting the facts to

W. T. Cavanaugh, EJC
29 West 39th St.
New York 18, N.Y.

TOOL—General Electric's E. E. Zwicky, speaking before the ASME, pointed to the coming partner relationship which will develop between the engineer and today's digital computers.

The computer's value lies in being able to try many possible combinations quickly and efficiently. Aside from selecting combinations of standardized parts that will meet a set of specifications, the computer can determine stress levels, size, weight, cost, etc. Once the best design has been selected, the computer can schedule factory work, order material, compute labor loads and even prepare customer billing.

But they can't cook!

—EW—

A recent demonstration of the role taxes play in business came from a release which told that Puerto Rico's electrical products industries showed six times the U. S. average profit. Other industries of Puerto Rico—rum and tourists.

—EW—

DECEPTIVE — C. Rogers McCullough, deputy director of the AEC, speaking of the urgency for the development of nuclear power plants, said: "Because of our abundant supplies of coal, there does not appear to be the pressing need for the development of nuclear reactors for power in this country that there is in other parts of the world. I believe this is deceptive.

"When we look at the very large job that needs to be done, I think we will then realize that there is not too much time for us to develop nuclear energy power sources in time to meet the ascending needs for electrical power and the dwindling supplies of natural resources of gas, coal and oil."

—EW—

Westinghouse has reduced prices on transformers with lower-than-standard noise levels. The new price policy in effect now for all new power transformers rated above 300 kva.

—EW—

ADDITION—Morris D. Hooven said: "The engineer of tomorrow must be a man of broad education and deep culture, capable of leading his people beyond the frontiers of his day."

He stated that "the real question which engineers must answer is

whether or not we are meeting the problems of the community." Also on the future, Hooven held "the time must come when womanly grace and intuition be added to the profession."

Here, Here!

—EW—

Only 7% of the 400,000,000 kwh required in the Northwest in the next ten years will come from hydrogeneration, states Fred A. Seaton, Secretary of the Interior. The remainder will come in large measure from the coal-rich areas of Wyoming. The increased use of Wyoming's soft coal deposits would herald a new industrial era for the state.

—EW—

Frank C. Parker of the Union Carbon & Carbide Corp. suggested that a code or standard for the use of ultrasonic testing of metals would greatly extend the usefulness of this nondestructive technique.

—EW—

Electronic data processing is going to point the finger at technical personnel of General Electric Co. when promotion and job opportunities come up. G-E has developed an Engineering Personnel Register that will permit scanning the qualifications of more than 10,000 technical people in a matter of minutes. The employee's objective, background, training, experience, present position and future interests are coded for the machine. A manager "tells" the machine what he needs—the machine "tells" the manager who is on hand to fill the job.

—EW—

Congratulations to Raymond N. Leach who was recently elected president of Jasper Blackburn Corp., St. Louis.

—EW—

CABLE—British Insulated Callender Cables Ltd. announces the use of 330,000-v cables in the Kariba Hydro plant following the receipt of an order from the Federal Power Board of Rhodesia and Nyasaland.

Three circuits, each consisting of three single-core 330-kv oil-filled cables

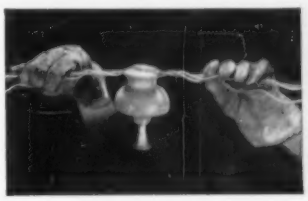
TURN MINUTES INTO YEARS OF Protection at the vital points of overhead conductors

Fine FANNER

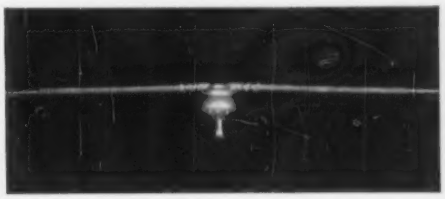
SUPERFORMED ARMOR RODS

are easily applied . . . provide positive full-length grip and absolute uniformity of application

Fine Fanner SUPERFORMED Armor Rods offer the economical way for positive, lasting protection of overhead transmission and distribution lines. Their INSTALLED cost is so small compared with the service failures they prevent, it pays to install them at all points where vibration damage is likely to occur.*



Armor rods are easy to apply.



Completed armor rod installation.

Whenever you need accessory items for overhead conductors you'll do far better by standardizing on fine Fanner SUPERFORMED products. Each product in the Fanner SUPERFORMED line is carefully engineered and accurately manufactured. Highest quality materials provide long service life. Special packaging insures safe delivery and protection in storage. With all their extra features, Fanner SUPERFORMED products cost no more than ordinary products.

Armor rods and other products in the SUPERFORMED line are fully described in current literature. Write today for your copy.

*Where spans are short and tensions low, use Fanner SUPERFORMED lineguards.

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THE FANNER MANUFACTURING CO.
Electrical Products Division
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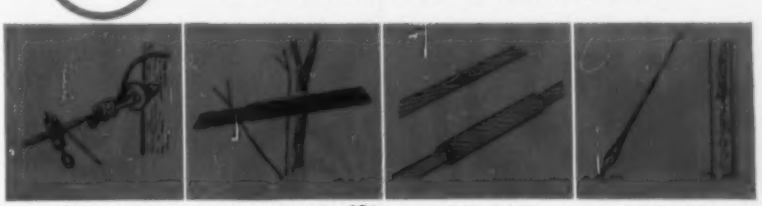
Fine Fanner Superformed

AGENTS AND DISTRIBUTORS IN PRINCIPAL CITIES



TAP ARMOR PLASTIC FANNGUARDS PATCH RODS FANNGRIPS

ALWALT
THE FASTEST GROWING NAME IN ELECTRICAL MFG.
NOW BRINGS YOU

GANGABLE & BUSSED INDOOR METER TROUGH

For Socket Type Meter . . .

METER CENTERS 10"
With Sealing Rings

Cat. No.	No. of Meters	Ht.	Width	Weight Each
171HVS	1	9	10	8 lb.
172HVS	2	9	20	14
173HVS	3	9	30	21
174HVS	4	9	40	27
175HVS	5	9	50	34
176HVS	6	9	60	40

Cat. No.	Description
171C	Connector
171E	End

Sold by Electrical Wholesalers Only

3 MAGIC WORDS:
- *Quality*
- *Service*
- *Follow Through*

ALWALT CO.
P. O. BOX 1171
MODESTO, CALIFORNIA

will descend 525 ft vertically to the underground power house. The cable will be specially reinforced because of the high head of oil. The cable is rated 1,500 BIL, 500 amp.

—EW—

REPERCUSSIONS—The Suez crisis had an immediate reflection on the prices of fuel oil. West Coast prices jumped about 40c per bbl up to approximately $2.50 per bbl.

The dependence of the Western region on fuel oil to supplement natural gas and hydro generation makes it a sure bet that production costs per kwh will increase during 1957—even with a rather dubious prospect for a quick settlement of the Egyptian situation.

—EW—

The energy available in ¼ cu in. of Uranium-235 can be equated to 10,000,000 cu ft of gas, 8,000 cu ft of coal, 4,700 cu ft of oil.

—EW—

GROWTH PICTURE—An attractive brochure produced by the B. C. Electric Co. highlights the growth prospects for western Canada.

Capsule summary: 9,380,000 additional horsepower will be required on that system between 1956 and 1980. This is the equivalent of 66 Ruskin hydro stations. Ruskin is B. C. Electric's largest plant, having a capacity of 141,000 hp.

—EW—

The Philadelphia Electric Co. is building a power station that will convert 40% of the heat contained in a pound of coal into electrical energy. This feat, when achieved, will create power more efficiently (by 3%) than any plant operating today. The plant will supply steam to the turbine at 5,000 psi and 1,200 F. The "once-through" boiler will have 150 miles of 1½-in. tubing.

—EW—

Electrical engineers will be surveyed this year with several studies covering a range of subjects from salary information to their attitudes on licensing, unions, and the proper use of their talents. Similar studies have been conducted by doctors, lawyers and architects groups with excellent results. The important thought—*fill 'em out and send 'em in.*

IRRADATION CENTER—Stockton, Calif., will be the site of the Department of Defense ionizing radiation center to preserve food for the defense forces.

The ionizing radiation center will include a reactor ($3,000,000) and other facilities including a high-energy particle accelerator.

—EW—

Kaiser Aluminum & Chemical Corp. has acquired the Hokin Aluminum Co. extrusion plant at Dolton, Ill. D. A. Rhoades, vice-president and general manager of Kaiser, says the Hokin plant acquisition will enable his company to speed up by approximately two years a planned extrusion expansion program.

—EW—

ATOMIC FUEL—The Atomic Energy Commission estimates that the U. S. uranium oil reserves has 60,000,000 tons. In Canada there are an additional 225,000,000 tons.

The production of uranium oxide doubled in 1956 to an estimated 8,000,-ton annual rate. Uranium oxide is the concentrate from which nuclear fuel elements are made.

—EW—

Housing starts in the U. S. for the first 11 months of 1956 totaled 1,032,400, down 203,600 from the same period in 1955.

—EW—

PRICE HIKE?—G-E's President Ralph Cordiner hinted that a price rise on electrical apparatus and equipment may be expected in 1957. General Electric's net income increased only 5% on an increase in sales of approximately 30% in 1956.

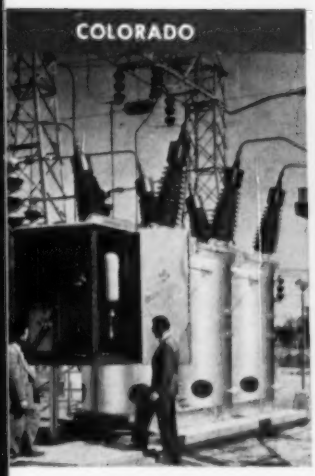
—EW—

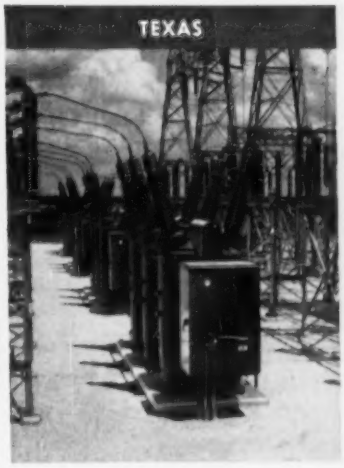
KUDO—Arizona Public Service Co. was nominated for a special citation as an excellently managed public utility by the American Institute of Management. On a point system of evaluation, which covers all phases from sales figures to fiscal policies, the company scored 8,225 points out of an optimum rating of 10,000.

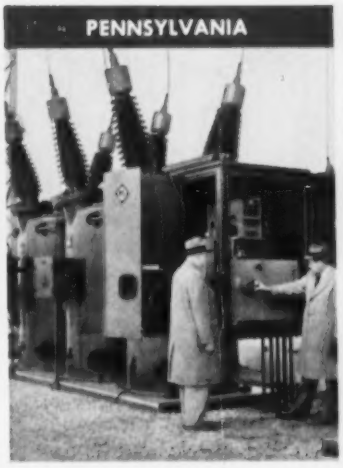
—EW—

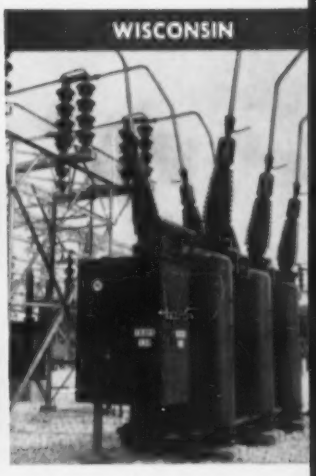
The United States Steel Co. is producing, semicommercially, decorative steel sheets in as many hues as those in Joseph's coat. This new product promises new eye appeal for such electrical devices as refrigerators, radios and other items of home furniture.

Utilities everywhere like Pneu-Draulic operators

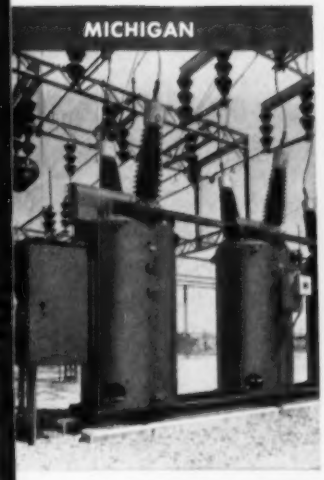


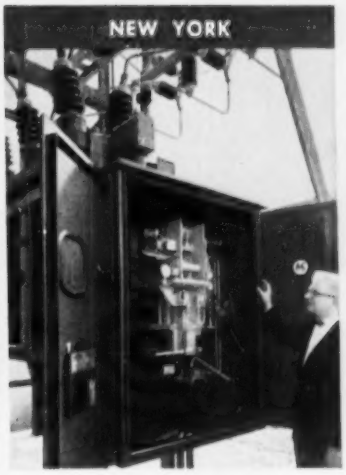


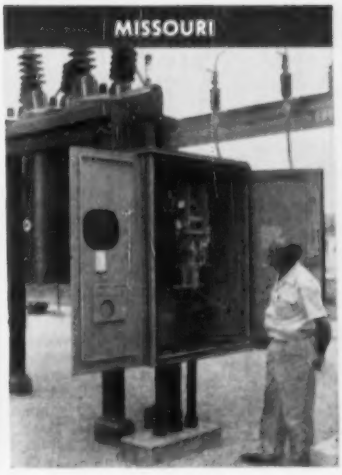


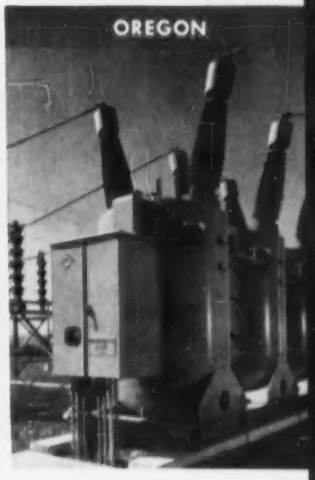


for their simplicity, reliability









***Pneu-Draulic* operators offer Utilities many advantages:**

- Simplicity — Compact design with few moving parts.
- Eliminates moisture, and corrosion problems — Entire system filled with oil containing inhibitor which eliminates rust, freezing and corrosion.
- Safe emergency closing — Breaker can be closed *safely* at full rated speed onto energized line even when no control power is available.
- Mechanically trip-free operation — Fully mechanically trip-free for complete system protection.
- Available on a wide range of breaker ratings — Breakers rated 500 mva and larger use the *Pneu-Draulic* operator as standard equipment.

Get details on these and other features of Allis-Chalmers breakers. Call your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

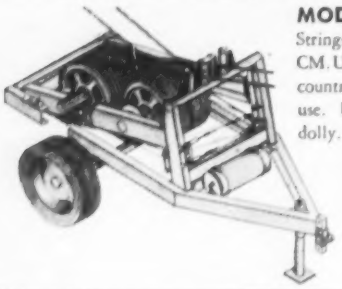
Pneu-Draulic is an Allis-Chalmers trademark.

A-5205

Partial showing of the now ***COMPLETE*** line of . . .

PENGO TENSION WIRE STRINGING EQUIPMENT

Manufactured By PETERSEN ENGINEERING CO., Santa Clara, Calif. • 14 Patents Pending.

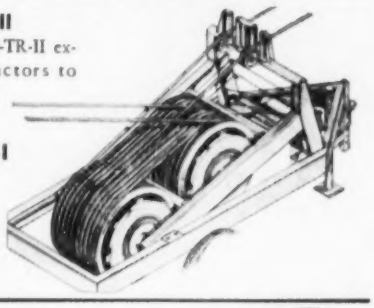


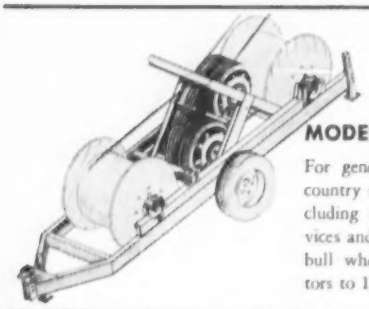
MODEL 5000-TR-II
Strings two conductors to 556,300 CM. Used primarily for very rough country work; also for general use. Use separate reel-carrying dolly.

MODEL 5000-TR-I
Similar except strings one conductor.

MODEL 6000-TR-II
Similar to Model 5000-TR-II except larger. Conductors to 1,272,000 CM.

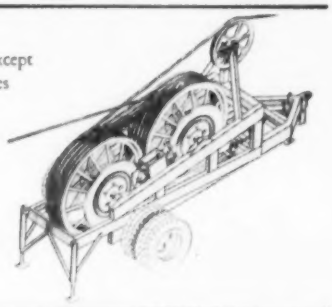
MODEL 6000-TR-I
Similar except for one conductor.

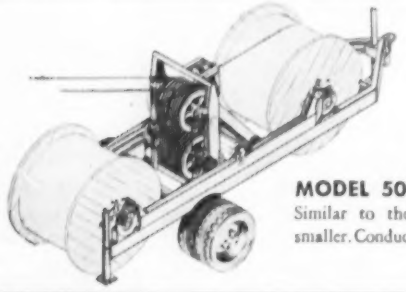




MODEL 6000-WS-TR
For general and medium rough country use. A complete unit including trailer, reel-carrying devices and its own double pair of bull wheels. Conductors to 1,272,000 CM.

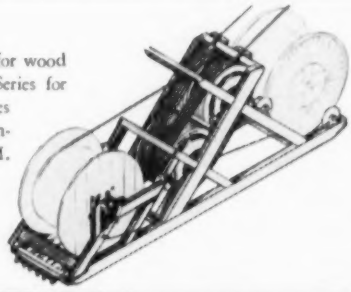
MODEL 7000-TR-I
Similar to model 6000-TR-I except larger. Conductors to 2 inches diameter.

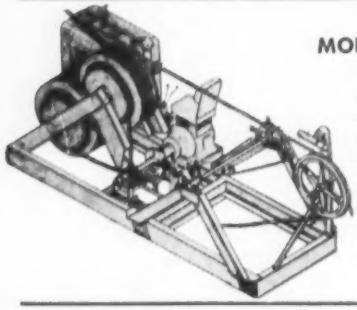




MODEL 5000-WS-TR
Similar to the 6000-WS-TR but smaller. Conductors to 556,300 CM.

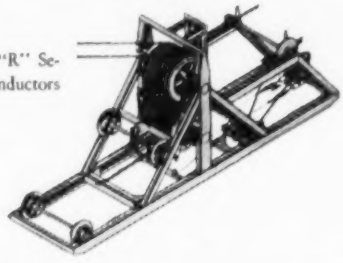
MODEL 6000-W
Available in "S" Series for wood or steel reels, in "R" Series for steel reels, or "SR" Series for trailer mounting. Conductors to 1,272,000 CM.

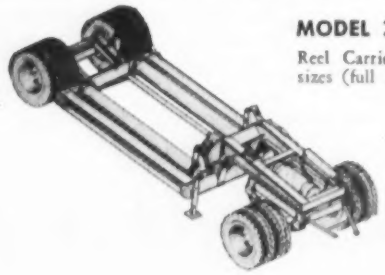




MODEL 6500
Bull Wheel Cable Puller. Available in "R" Series for steel reels, "S" Series for wood reels. Conductors to 1,272,000 CM. Also available in "LWR" Model for extra-large steel reels. Model 5500 similar (smaller).

MODEL 5000-SR
Available in "S" Series, "R" Series, or "SR" Series. Conductors to 556,300 CM





MODEL 7500
Reel Carrier. Takes the largest sizes (full range) of steel reels. Loads and unloads with one man. No auxiliary equipment needed except the truck that pulls it. For use with any one of the tensioning machines shown on this page.

ADDITIONAL MODELS NOT SHOWN

Tension Reel Trailers

MODELS 2, 3, and 4, Two-Wheel Straddle Dollies not shown. For use with any one of the tensioning machines shown on these pages.

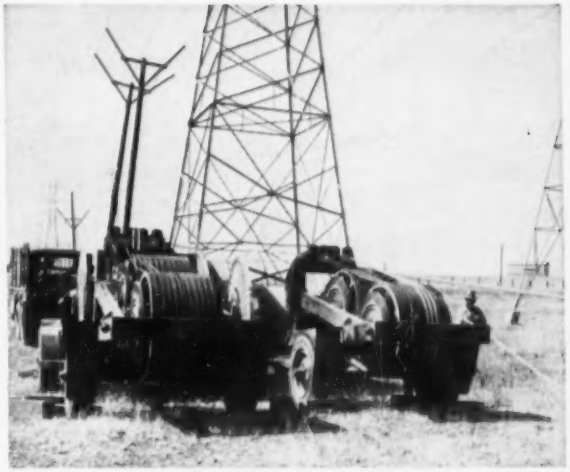
Tension Stringers

MODELS 6000-SK-I and 6000-SK-II For one or two conductors to 1,272,000 CM. Skid mounted for installation on owner's equipment.

MODELS 5000-SK-I and 5000-SK-II Skid mounted for installing on owner's equipment. For stringing one or two conductors to 556,300 CM.

MODEL 5000-WS-III Strings three conductors to 556,300 CM. For mounting on low-bed or full trailer.

MODEL 6000-WS-III Strings three conductors to 1,272,000 CM. For mounting on low-bed or full trailer.



Two PENGO model 6000 TR-II wire tensioners being used by Pacific Gas and Electric Co. in reconductoring job between Vacaville, Calif. and Cottonwood, Calif. 285 miles of 500 MCM copper is being replaced by 954 MCM aluminum in this operation.

Newest method of stringing overhead lines

Two PENGO model 6500 Bullwheel Cable Pullers used by Pacific Gas and Electric Co. for pulling in the new line on the job mentioned above. Unit, manned by an operator and one reel tender, pulls the pulling line (in this instance the old copper conductor) over the double neoprene lined Bullwheels and winds it for shipment in a single operation.

- **Safest, most economical way of stringing transmission, distribution and even secondary lines.**
- **Its greatest savings are effected when stringing over and through energized circuits . . . by far the safest, too!**
- **14 Patents pending.**

Smooth, postive control of conductor tension can be maintained at all times regardless of model or size of PENGO tensioning equipment used. The large, specially designed PENGO disc brakes are mounted away from the Bullwheels to assure dissipation of the heat generated by the continuous braking action and prevent transmission of the heat to the Bullwheels.

Note the wide range of models on the opposite page available for all types of jobs or terrain and for all sizes of conductor.

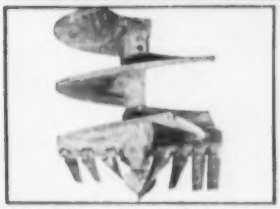
List your requirements and send for descriptive literature and prices.

Made by the makers of the World-Famous
PENGO EARTH AUGERS

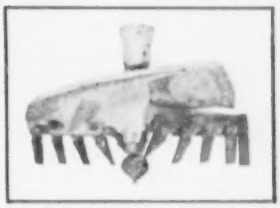
PETERSEN
ENGINEERING COMPANY
Santa Clara, Calif.

PETERSEN ENGINEERING CO.
Santa Clara, California **Dept. 3**
Please send me more information on the new Pengo wire stringing equipment.
Name _____
Firm _____
Address _____
City _____ State _____

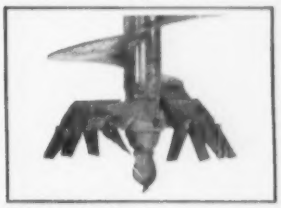
Other PENGO Products include:



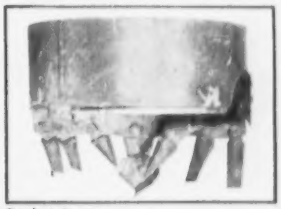
24 inch Heavy Duty Flight Auger



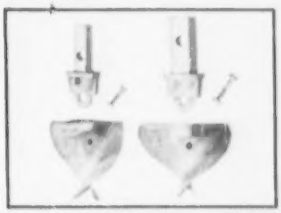
Double-Helix Heavy Duty Auger



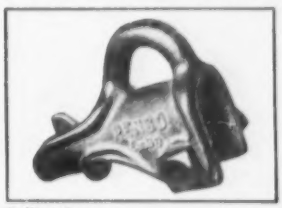
Offset Boring Head



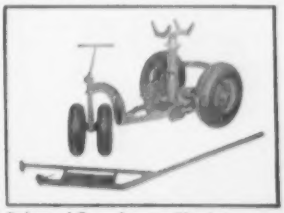
Bucket Auger



Screw Bit for Small Diameter Holes

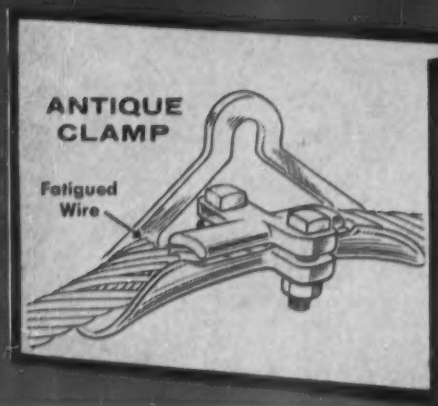


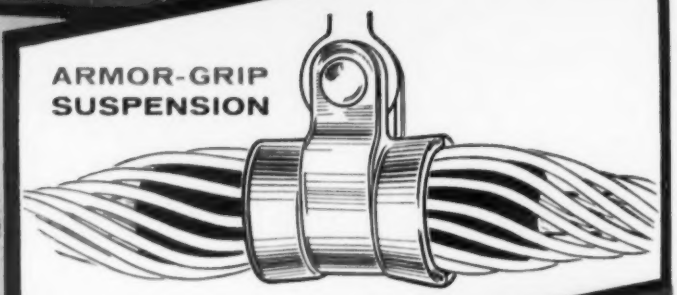
Pulling Eye



Pole and Transformer Chariot

"PERFECTING not PERFECTION is our goal" *





"they both suspend the conductor, BUT . . ."

. . . *yesterday's answers* are not good enough. Today's will need improving tomorrow.

Take the problem of vibration fatigue. Failure of strand because of vibration or galloping does not occur in mid span. But it becomes a real problem at points of stress concentration, such as the end of the clamp keeper—at mass concentrations, such as at clamps, dampers and rigid splices—or at wearing points at loose attachments or fastenings.

Yesterday's answer—Preformed Armor Rods, introduced by Preformed Line Products Company in 1947.

Today's answer—PLP Preformed Armor with pitch direction the same as conductor strand and pitch length less than that of strand (Patent No. 2,609,653). When used in conventional clamps:

- it extends uninterrupted conductor life
- it eliminates wear possibilities
- it prevents excessive mass and stress concentrations

Tomorrow's answer is here today: the Preformed armor rod principle carried one step further in Preformed's ARMOR-GRIP SUSPENSION (Patent No. 2,722,393), the entirely new concept in suspension design.

The Armor-Grip Suspension Unit is a "floating suspension"—the conductor is cradled in neoprene and firmly gripped only by the custom-designed Preformed Rods which distribute their pressure over a relatively large area. The result: no wear possibilities—no mass concentrations—*and no clamping stress concentrations.*

This is another example of PLP research laboratories at work. Ever improving methods, materials and solutions is our goal. Call a PLP Representative today and ask for a demonstration.

* *John Dewey, "The Reconstruction of Philosophy"*

Made in accordance with or for use under one or more of the following U. S. Patents: 2,722,393; 2,275,019; 2,587,521; 2,609,653; 2,691,865; other patents pending.

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Intermountain Region

MANUFACTURING of guided missiles is the newest industry to touch off another surge of expansion by Colorado Central Power Co., serving the suburbs of Denver.

Colorado Central is finishing this month the construction of two 115,000-v transmission lines to the new Glen L. Martin plant, 15 miles southwest of Denver, where guided missiles will be built.

"We're likely to get other industries in this area as a result of the Martin plant," says J. E. Wilson, commercial vice-president for Colorado Central.

Wilson, also vice-president of the Rocky Mountain Electrical League, looks for a "5 to 7% increase" in the number of customers to be served this year by Colorado Central. This will be a gain of at least 1,500 customers. Kilowatt-hour sales topped 200,000,000 for the first time in 1956.

To meet some of the problems of continuing growth, Colorado Central established the new position of superintendent of operations effective Jan. 1. G. A. Beeten, a 20-year employee who has been district manager at Fort Lupton, was appointed to the position. Beeten takes some of the responsibilities that were formerly assigned to Emory K. Mallory, general superintendent. Both report directly to Lee R. Jones, vice-president in charge of operations and construction.

William J. Richards, who has been service superintendent for the Fort Lupton district, was promoted to Beeten's former job as district manager.

Beeten was among long-time employees honored recently at a Colorado Central awards party. He received a 20-year service pin. Robert W. Todd, district manager at Golden, was presented a 25-year service pin. Wristwatches and 15-year service pins were awarded to Forrest E. Edwards, superintendent of the Golden district; Fred H. Olmstead, superintendent of construction of the Arapahoe district, and A. Douglas Stanley, a dispatcher.

► If it isn't kites it's model planes. Raymond Trujillo, 22, of Denver was burned when the control wire of his model airplane crossed a high-voltage line. The current shot through his body to the ground, destroying the thin control wire on the way. He was hospitalized for a few days for treatment of severe hand and chest burns.

► Jo Ann Raber, 17, of Whitewater, Colo., was one of six national award winners in the 4-H Club electrical program. Among her accomplishments: wiring her 12-room home, a garage workshop, a calf shed, two building additions and making a belt sander, electric marking pencil and a lamp.

► H. V. Van Valkenburg of New York City, general sales manager for Anaconda Wire & Cable Co., visited Denver for conferences with Kenneth G. Eaton, Rocky Mountain regional manager. Another caller at Denver was E. S. McGlone of New York City, executive vice-president of the parent firm, the Anaconda Co.

► Both Rocky Mountain regional and Denver district offices of Allis-Chalmers Mfg. Co. have been established in a newly completed Denver office building known as 655 Broadway. Two new service engineers have been added to Allis-Chalmers staff in the region. Oliver Leonard is stationed at Phoenix, Ariz., and Don Alworth at Denver.

► Harris Steele of Denver was installed Jan. 7 as president of the Rocky Mountain Chapter of the National Electrical Contractors Assn. He succeeds Bert Stiles of Denver, who becomes treasurer. Other officers are Dale Strohminger, vice-president, and E. C. Armstrong, secretary, both of Denver. J. E. Collier of Denver was elected as chapter representative to the national board of governors. Ralph Johnson of Denver was elected earlier at San Francisco as vice-president for the Rocky Mountain district. New directors of the Rocky Mountain Chapter are Roy Kennedy, Lawrence Rider, Steve Strong, Glenn Tully, Carl Krummel and Dave Sturgeon, all of Denver. District directors are F. W. Fitch, Cheyenne, Wyo.; John Peach, Casper, Wyo., and Don Prahl, Laramie, Wyo.

► The first 100,000-kw generator has been hoisted into place at Public Service Company of Colorado's big new Cherokee plant. It was built at Schenectady, N. Y., by General Electric and shipped to Denver on a special 16-wheel railroad flat car. The generator, weighing 179.5 tons, was lifted 20 ft from the car into the generator room on a 175-ton traveling crane with a double prong hook weighing nine tons.

The hook, made at the Bedford Crane Co.'s Indiana factory, arrived by truck just in time for the big lift.

As Ben Snow, general construction superintendent for Ebasco, reflected: "One of the headaches of this game is trying to make shipping times match. If that hook hadn't got here, the crane would have been useless. And if the generator car hadn't been unloaded on time the demurrage charges on that special car would have been enormous."

Public Service has another 110,000-kw generator on order for the Cherokee plant, which will cost about $37,000,000.

► Square D Co. has opened a new plant at Denver with more than 20 employees. The one-story building, costing $250,000, has been located on a site suitable for expansion. Manager George Helbock said the company is recruiting electrical engineers to staff the new plant, that will serve the entire Rocky Mountain region. Top officials of Square D were welcomed at a Denver Chamber of Commerce luncheon. Among them were Gordon Patterson, president, and L. G. Maechtlen, vice-president and general manager of the Western division, and Helbock.

► REA Administrator David A. Hamil told the Wyoming Rural Electrification Assn. that 80% of Wyoming farms and ranches receive power through REAs compared to 3% 20 years ago.

Wyoming REAs were urged by J. Harold Cash of Kaycee, the association president, to ask the 1957 legislature to exempt REA property from taxation. The 1955 Wyoming legislature repealed a property tax exemption for REAs that has been in effect many years.

► W. L. Duncan of General Electric Supply Co., Denver, who heads up the sales and promotion committee of Colorado Farm Power Council, reports that the 1957 promotional program will follow this general pattern: water systems—March, April and May; farmstead and home lighting—September, October, November and December; laundry equipment—January, February and March; ranges and water heaters—March, April, May and June; food freezers—July, August

and September; traffic appliances and power tools—May and June, November and December.

▶ R. F. Walker has been appointed Public Service Co. of Colorado representative on the Rocky Mountain Nuclear Power Study Group with the Atomic Energy Commission at Idaho Falls, Idaho. He succeeds C. K. Millen who has been the PSC representative since the group was established in 1954. Walker has been in the company's electric system planning department where he will be succeeded by Julian Hayden. Millen returns to Denver to become a staff engineer reporting to L. R. Patterson, assistant vice-president of electric operations. The shift was made to broaden PSC's knowledge of nuclear power, officials said.

Northern California Region

ELECTRIC Club of San Francisco acknowledged its 45th anniversary Dec. 10 with a double bill featuring Charlie "Sparks" Huyck, secretary-treasurer, and Joseph S. Thompson, 50-year veteran president of Federal Pacific Electric Co. Charlie's nostalgic reminiscing drew a standing ovation and Joe's colorful recollections tickled the funnybone of everyone.

▶ Among recent Bay Area visitors was Eric E. DeMarsh, vice-president and division manager of Burndy's utility-industrial division, Norwalk, Conn. Eric had visited the Lynwood plant and was en route to the various Pacific Coast sales territories before a return to the East.

▶ Kurt Steindorff of General Electric Co. is circulating again after undergoing surgery. Best sign of his physical well-being is the enthusiasm he was showing as he fined wayward (or just unfortunate) members of the S. F. Electric Club.

▶ One of Kurt's victims was Ray Waggoner, Hubbard & Co. vice-president, who was nicked two bucks for being named a director of the Pacific Coast Electrical Assn. Before he was able to regain his composure and his seat, he had to pay another $2 for having a recent vacation in Hawaii.

This tank will house a reactor core mock-up at General Electric's new atomic development facility being built at San Jose, Calif.

▶ Art Bragg and Charlie Goodwin will be back with us again about the time you are reading this. They have been in Crotonville, N. Y., taking General Electric's advanced business management course for the past three months.

▶ Dr. Erwin F. Lowry and Theodore C. Sargent of Sylvania were in the neighborhood to hold a lighting design meeting for architects, engineers, utility representatives and electrical contractors.

▶ Philco Corp. has purchased the Sierra Electronic Corp. of San Carlos in a move to expand its research, development and engineering facilities. Sierra will operate as a wholly owned subsidiary.

▶ When 1956 figures are made available, they will show that the Bay Area has accumulated more than 22,000 new dwelling units. This brings the total to more than 300,000 since Jan. 1, 1950.

Pacific Southwest Region

NATIONAL Electrical Week, Feb. 10-16, will be celebrated in a big way in the Los Angeles area, according to the Los Angeles Electric League's Glen Logan. One of the top activities planned, he reports, is luncheon at the Biltmore Bowl Feb. 11, in cooperation with the Electric Club's Valentine Party. The occasion will be marked by the selection of "Mrs. Electric Week." All dealers and distributors will be alerted to take advantage of E-W and surround promotions with the Valentine idea.

▶ General Electric Lamp Division's new $2,000,000 office and warehouse facility at Malt and Telegraph Road, Los Angeles County territory, is nearing completion. E. C. Herron of the division's Southern Pacific sales district estimates the warehouse will be ready for use sometime in January and the offices around the first of March. The move, says Herron, will mean consolidation at one site of all the Lamp Division's operations, now at three separate locations.

▶ Agencies Co., Los Angeles, acquired on Nov. 1 the Hatfield Wire & Cable line and the firm reports that T. G. Tesman, Agencies' president, along with salesmen Mac Silverman and George Adams, made a cross-country trip to attend a general sales meeting at Hatfield headquarters in Hillside, N. J. The company also notes that it hopes to complete the move into additional new warehousing facilities, adjacent to its present location, by the first of the year.

▶ Leonard Hobbs, vice-president of Smoot-Holman, says they expect to have their new plant addition, which will be around 10,000 sq ft of production space to the present Inglewood plant, completed in January.

▶ Kenneth Anderson Co., Los Angeles manufacturers' agent for Killark Electric Mfg. Co., the time-switch section of Sangamo Electric and Plastic Wire & Cable, plans to relocate at 125 S. Meyers St. in Los Angeles around March 15. The change will mean more office and warehouse space. The firm recently opened a branch office in San Diego, employing the services of J. J. (Jack) Murphy, formerly with Western States Wholesale Electric Co. in that area. Anderson said he believes they are one of the first manufacturers' representatives to establish a branch in that community.

▶ The California-Nevada Chapters of NECA have scheduled their annual conference for Jan. 11-12 at the Hacienda Motel in Fresno, Calif. The conference will be chairmanned by the new District 9 vice-president, Rollie Goold.

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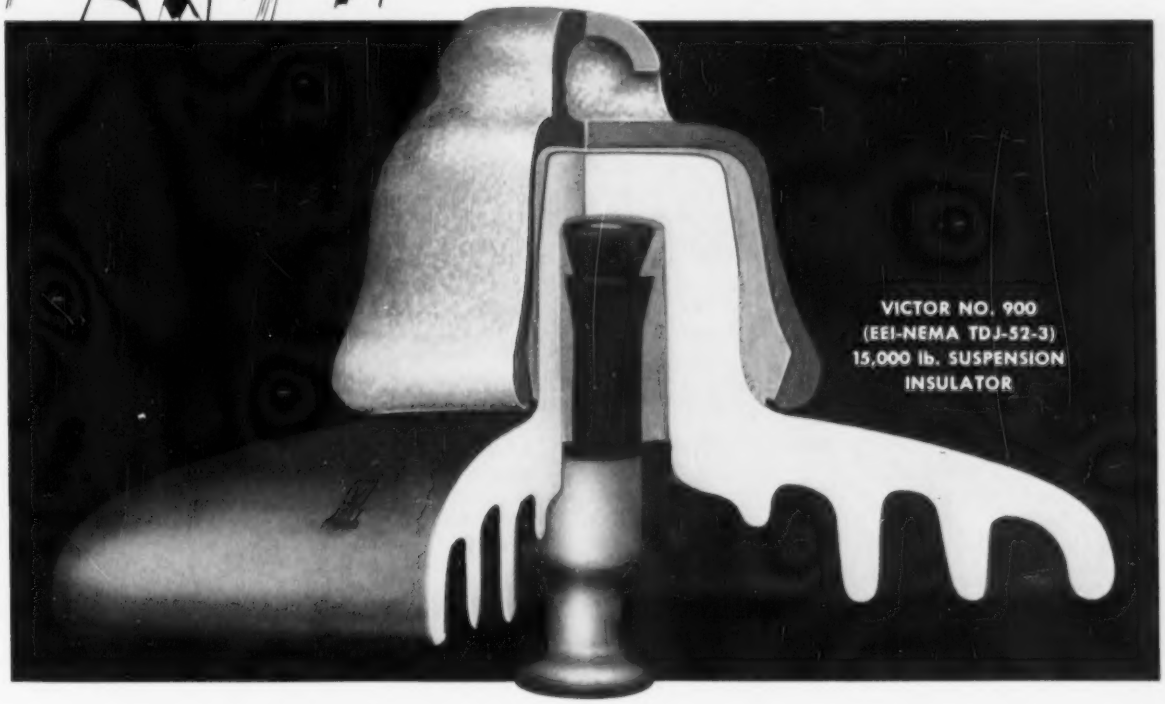

Men who purchase insulators are enthusiastic about the service records of VICTOR Suspensions. That's because VICTOR Suspensions are laboratory designed, manufactured under rigid quality controls and tested with the industry's most modern equipment.

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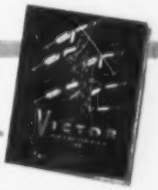

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► Jarvis Electric Supply Co., wholesaler for the southern California area of electrical construction materials and appliances, moved Nov. 15 from S. Crocker St. in Los Angeles to new office and warehouse facilities at 1415 E. Washington Blvd. The move will give them more than 50% increase in space.

► Robert M. Allan Jr., works manager for Jeffries Transformer Co. of Los Angeles, says the firm's new (officially opened last July) Turner Street plant is now in full production. The company, which builds dry-type transformers for general purpose distribution, lighting and power service, is particularly proud of its testing laboratory, designed and equipped to simulate actual field operating conditions.

► For the first time since the inception, Jan. 1, 1956, of the revised Los Angeles city electric code, recommended ordinance changes will be placed before the city council by the code committee, in an effort to iron out the kinks. No major alterations are anticipated.

► Coming up on the Electric League's agenda Feb. 16 is the league's annual meeting, to be held at the Hollywood Roosevelt Hotel. While the place is the same, the affair takes on a new face this year—will be built around the Mardi Gras theme—and held on a Saturday night. Irene Couts, home economist for J. N. Ceazan Co., and Bob Thompson, sales manager of Packard-Bell, will be co-chairmen.

► Southern California Edison and the Los Angeles Department of Water & Power joined forces Dec. 3 to provide the fluorescent lighting display at the "Spring of 1957 California Millinery Guild Fashion Show and Press Review," held in Los Angeles' Ambassador Hotel. The show, viewed by some 300 buyers and display managers, offered the utilities the opportunity to demonstrate to the millinery industry the importance of lighting in showing its merchandise. Two large lighted display cabinets were featured in which the models posed and response to the lighting effects was tremendous, said Ted Shepherd, who handled the display for the department in conjunction with Edison's Roy Dahlen.

Shepherd, chairman of the educational committee of the Certified Lighting Assn. in this area, also announced that the third training class had graduated 39 students in November.

Pacific Northwest Region

EDEN RIDGE, the legitimate offspring of executive discovery and an engineer's dream, is a name to think about this winter as the permit to build it, filed by Pacific Power & Light Co., went into hearing before the Oregon Hydroelectric Commission the middle of December. Primary personalities in the case are Paul B. McKee, president, and E. Robert DeLuccia, vice-president and chief engineer of the company.

McKee discovered it and conceived it as a possible hydro project when he flew over southwestern Oregon in the company Cessna studying an entirely different company problem. There was the south fork of the Coquille River, flowing 12 miles around Eden Ridge, and dropping 1,650 ft through a series of steep falls and rapids. A dam at the upper end of this 12-mile loop and a 2-mile tunnel through the ridge would deliver water to the power house at the lower end to utilize this 1,650 ft of head.

The engineer's dream was experienced by DeLuccia to whom, of course, McKee turned over the preliminary investigation. River flow was found to vary from 6 sec ft to 3,000 sec ft. But —there was coal in "them thar hills" and the project evolved as a combination hydro-thermal development, with steam plant and hydro plant supplementing and firming each other. Came then DeLuccia's dream—suppose the tunnel for the water could follow a coal vein, so that the spoil from the tunnel could be stored to burn in the boilers of the steam plant. Only time and further investigation will tell.

The project will serve the fast-growing Coos Bay area and will bolster the power supply in a far corner of the company's far-flung territory. The company is carrying on another investigation in the area, namely, the possible availability of an industrial water supply under the sand dunes near the edge of the sea. Some promise of bringing out this water is indicated, and, if it is found economic, the way will be opened to establishing pulp mills there to use some of the region's vast forest resources.

► Up in Puget Sound area, some of the old-timers are sorry to see the demise of the old Electric Building at Seventh and Olive, Seattle. During the month the Puget Sound Power & Light Co. offices have vacated the old landmark and have spread into three new buildings in the suburbs: Kirkland, Renton and Bellevue. The load dispatcher's office and communications department

has moved to the new eastside communications center near Kirkland; the central division under Vice-president L. A. (Bill) Williams is at Renton; and general office departments, some of which were formerly in the Stuart Building, have just moved to the new building in Bellevue, 10608 N. E. Fourth St., telephone Gibson 6363. Among these are A. L. Pollard and C. F. Monson of the operating staff and General Commercial Manager R. F. Plymire.

C. Pat Johnson, vice-president, and Reg Plymire have switched some responsibilities. Plymire has taken over general sales with Clarence Scheyer as sales manager; Johnson keeps personnel and accident prevention, and remains in the Stuart Building. Others left in the Stuart Building are: Frank McLaughlin, president, L. E. Karrer, executive vice-president, J. H. Clawson, treasurer, R. W. Peterson, controller, and H. E. Forman, public relations and advertising.

► Portland electrical folk took a prominent part in the hurriedly formed, quick-functioning Hungarian refugee relief. A self-starting committee originating in one of Portland's residential areas selected Paul Ousley of the Dan Kamphausen Co. as general chairman; and Frank Bosch, vice-president of Portland General Electric Co., and Don Frisbee, assistant treasurer, Pacific Power & Light Co., to be co-chairmen of finance. The committee, expecting that Oregon's quota will run about 250 immigrating refugees, is setting up to pay their expenses from New York to Portland and to help them get settled and find jobs after they arrive. In the latter process, material help is being secured from W. L. Vinson of Portland's Local 125, IBEW. Of the first 18 to come in, Pacific Power & Light immediately hired four after their being interviewed by Don McClung, executive vice-president.

► Don Frisbee, mentioned above, has an interesting job, the only one like it among the Northwest utilities. He heads the group studying the operation of the company's new million-dollar electronic data processing machine, sometimes referred to in the company as The Monster. Frisbee doesn't like to have his pet called this, claiming it is completely docile and will not attack women and children as monsters do in the movies. In fact, he says that, although it has a prodigious memory, it is only as good as the brains put into it by man and can only answer "yes" or "no" to the questions put to it. The writer is glad to learn this, having feared that such devices would be taking over some of our other functions

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with a PRE-TESTED LIFE!

Here's a transformer that can actually help you program your equipment investment thirty years from now—today. How? Through a revolutionary new concept of accelerated life testing, Westinghouse has pre-tested transformer life. Thirty years of equipment service has been telescoped into three.

Entire transformers from the production line have been put through literally thousands of cycles of overload up to 450% of rating, under closely simulated service conditions. Masses of data used to set up this unique program of testing include representative ambients as well as abnormal currents and voltages such as lightning and switching surges. Here is exhaustive evidence of durability of materials, uniform strength of windings, capability of whole insulation systems. Here is foolproof evidence of the soundness of Westinghouse transformer design . . . evidence that test-tube testing can't match.

The new Westinghouse Type S and CSP® transformer developments are based on the soundness of this design. Overload capability for all transformers has now been increased 20%, *without sacrifice in normal service life.* You get transformer capability tied more closely to modern load demands . . . a greater margin for peak. For the CSP transformer . . . fewer trip-outs, more time to make change-outs.

Are these transformers at these ratings proved on the line? 10,412 uprated Westinghouse transformers have operated successfully up to three years throughout the systems of utilities in New York, Missouri, Texas.

So here is double proof of performance of Westinghouse transformers. You don't have to gamble.

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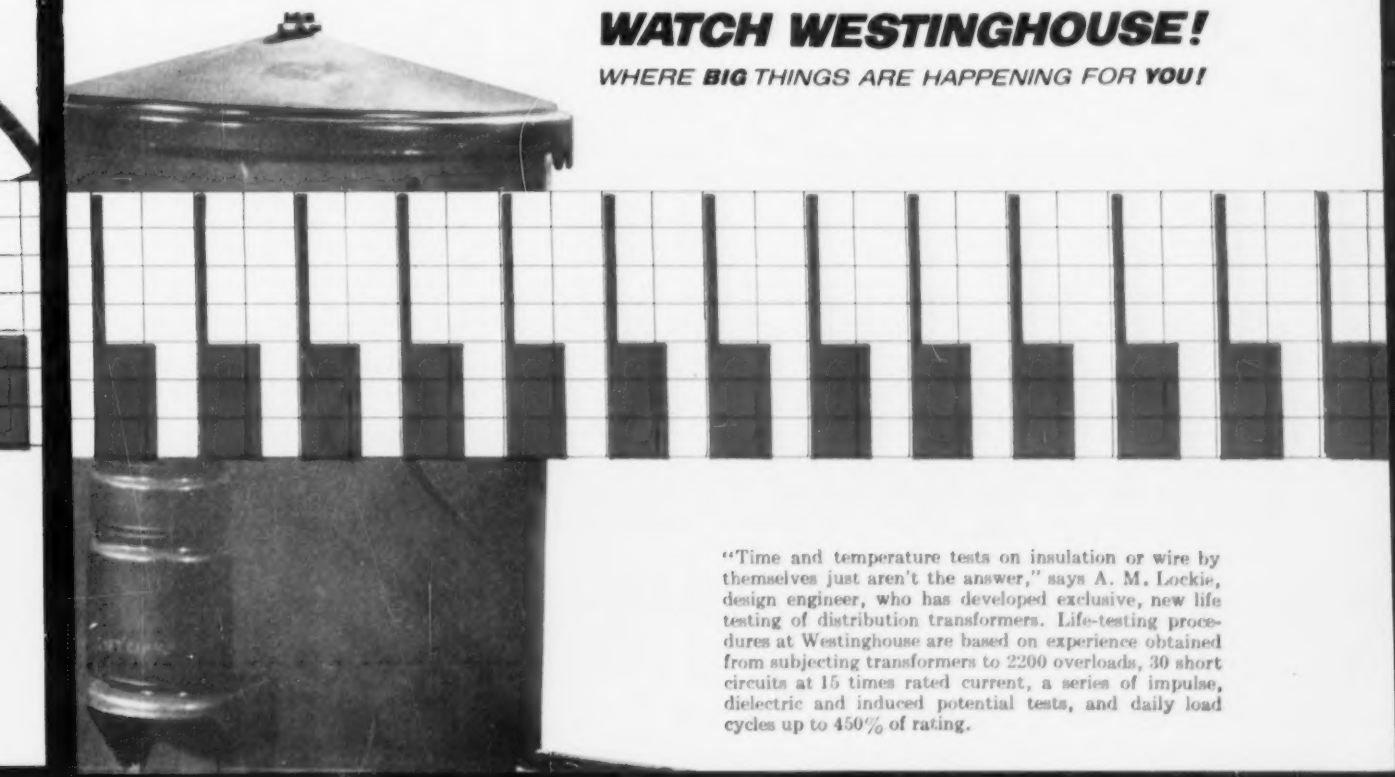


"Time and temperature tests on insulation or wire by themselves just aren't the answer," says A. M. Lockie, design engineer, who has developed exclusive, new life testing of distribution transformers. Life-testing procedures at Westinghouse are based on experience obtained from subjecting transformers to 2200 overloads, 30 short circuits at 15 times rated current, a series of impulse, dielectric and induced potential tests, and daily load cycles up to 450% of rating.

PRODUCT NEWS

New Designs and Applications

Bus Welding Fittings

(1) Penn-Union Electric Corp., 315 State St., Erie, Pa.

Aluminum welding fittings that permit construction of A-frame substation buses without bias cutting or complicated layout is announced by this manufacturer. Connectors have cylindrical bosses at correct angles to take the bus tubes. Straight lengths of tubing are inserted and welded.

Knife-Blade Fuses

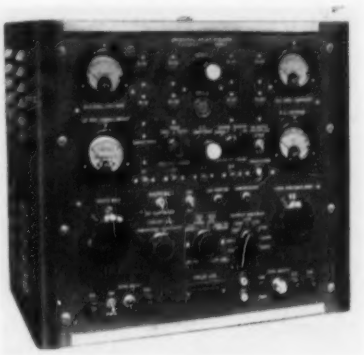
(2) Pierce Renewable Fuse Co. Inc., Leicester, N. Y.

Knife-blade fuses with replaceable links are offered by this company. The fuses are said to avoid unnecessary blows and afterblows by means of ventilation that prevents excessive temperature build-up within the fuse body. The knife-blade link is replaceable with the use of only a screwdriver after the fuse has been blown.

Seven New Wires

(3) Western Insulated Wire Co., 2425 E. 30th St., Los Angeles 58, Calif.

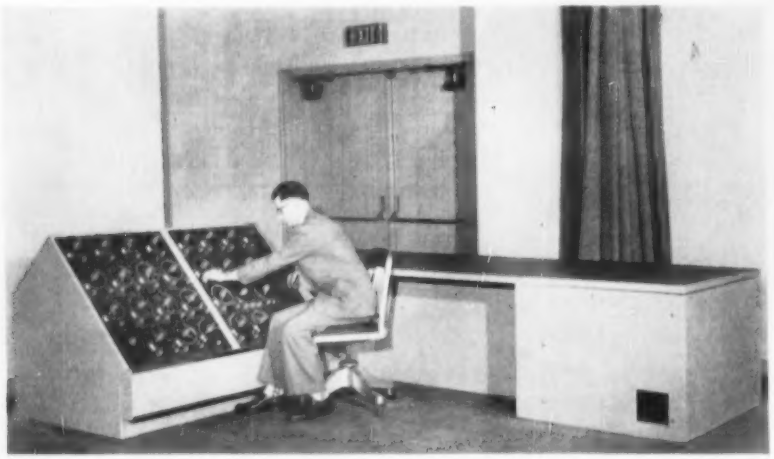
Seven new kinds of insulated wire are announced by this manufacturer. Two are of 600-v, style RR nonmetallic-sheathed cable, one for direct burial in the earth, the other for open wiring, raceways or ducts. Bronco 66 Certified type SO shielded cords are now made with two, three or four conductors, sizes 18 through 10. Five to 12 conductors in sizes 18 through 14 shielded control cables are color coded. The full line, including all the new items, are listed in a new catalog now available.



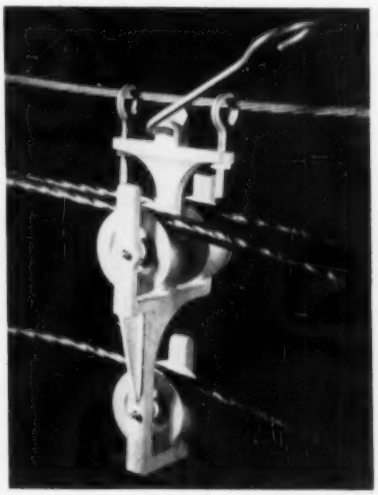
Relay Tester

(4) Magnavox Co., Beuter Rd., Fort Wayne, Ind.

Production is under way on this tester that checks relays for pull-in and drop-out voltage and current requirements, contact operation and insulation condition by hi-potting. All tests are accomplished by operation of switches and controls.



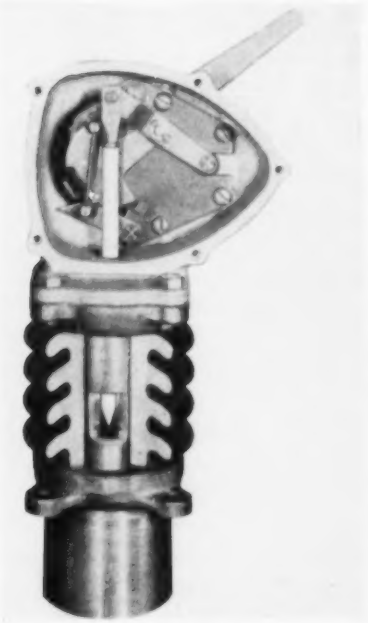
When this Westinghouse dispatch computer goes into operation early this year, it will compute the dispatch of the entire West Penn electric system. The system, composed of three principal operating companies, West Penn Power Co., Monongahela Power Co. and Potomac Edison Co., has a peak load of 1,440 mw and covers 29,000 square miles. Westinghouse Electric engineers believe the computer can save utilites $50,000 per year per 1,000 mw of generation by automatically and accurately computing the most economic dispatch



Stringing Block

(5) Hendrix Wire & Cable Corp., Dept. P, 19 Watson St., Boston 18, Mass.

Three pulleys in this new stringing block are said to make aerial cable installation easier and faster. Blocks are positioned on messenger at 30-ft intervals with the three conductors in place as they are being pulled in.



Interrupter Switch

(6) Delta-Star Electric Division, H. K. Porter Co., 2437 Fulton St., Chicago 12, Ill.

Safe interruption of load, magnetizing and charging currents up to 600 amp, without danger of external arcing or flame, are within the capabilities of this company's new Powerupter switches. Features of a standard group operated vertical break switch and a newly designed interrupter are combined. Available in voltage ratings from 7.2 to 34.5 kv, in continuous current ratings of 400, 600, 1,200 and 2,000 amp.

Communications Filter

(7) Federal Telecommunication Laboratories, 500 Washington Ave., Nutley 10, N. J.

Improvements in size, operation and cost are claimed for this new magnetostriction filter. The unit is described by the manufacturer as an electronic "traffic cop" that prevents unwanted frequencies from interfering with the operation of radio equipment.

Corrosion Preventive

(8) Allied Porcenell Inc., 851 S. Market St., Waukegan, Ill.

Designed for use where corrosive elements are a source of coating failure and excessive maintenance cost, this silicate modified coating has the appearance of paint. It is applied with conventional spray equipment, and is said to dry to the touch in a few minutes on most applications.

Floodlight Poles

(9) Steber Mfg. Co., Broadview, Ill.

This company announces the addition of a group of hinged poles for service station floodlight mounting. They are available in 20- and 24-ft heights with or without dual and triple mounting brackets for attaching either two or three area floodlights.

Conductor Clamp

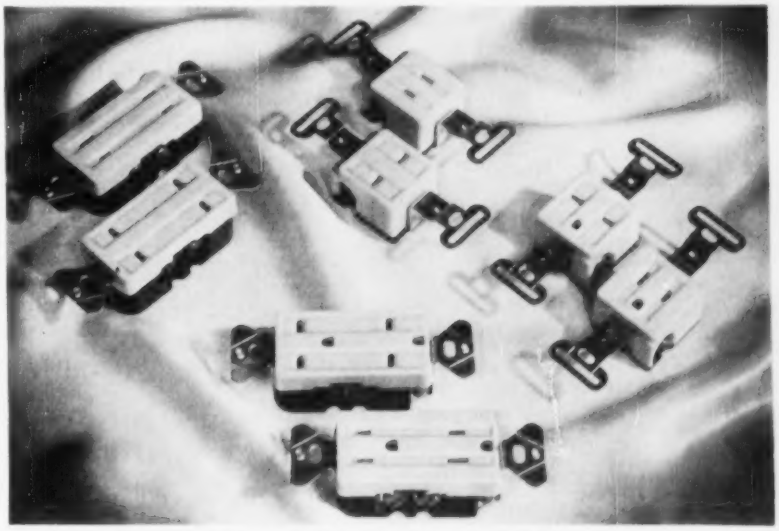
(10) Porcelain Products Inc., Parkersburg, W. Va.

A new design is said to give this clamp holding strength greater than the conductor it fits. Another feature is a keeper that can be reversed without removing the U bolt. Clamping range is from .2 to .50 in., and clamp has a rated strength of 10,000 lb. Designed for use on ACSR conductors from 4 to 1/0, inclusive, but can be used on copper, copper-weld and amerduct.

Aluminum Transformers

(12) Economy Transformer Co., 1021 N. Pearl St., Centralia, Wash.

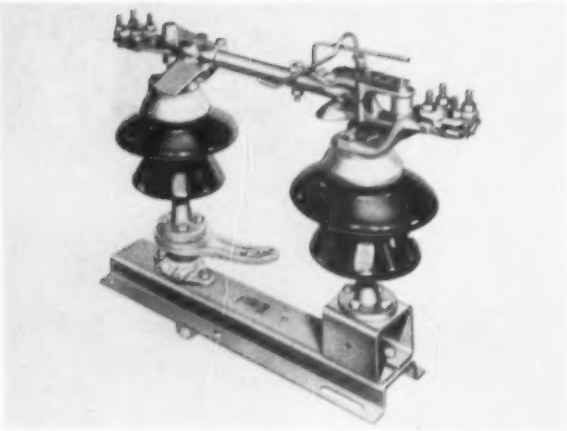
Transformers with aluminum cases made by this company have successfully withstood tests over a period of a year and a half, the manufacturer reports, and are now being marketed. Made of a special alloy aluminum, the tanks do not require painting and at this point show no signs of deterioration from exposure to salt air. Transformer cores are standard Arnold Engineering products. The new transformers are said to withstand heavy overload for long periods, and cool quickly because of the aluminum tank. The tank cover is welded on for moisture protection.



Wiring Outlets

(11) Sierra Electric Corp., 15100 S. Figueroa St., Gardena, Calif.

A complete line of outlets in a new contemporary design is announced by this company. The line includes two-wire and grounding types, single or duplex, and tandem or parallel slots. Wall plates matching the outlets are available in plastic, stainless steel or brass. Complete engineering information in an illustrated catalog is available. The complete line is shown in photograph.



Side Break Switch

(13) Line Material Co., 700 W. Michigan St., Milwaukee 1, Wis.

This new switch is designed for horizontal, vertical or inverted mounting, and is rated at voltages of 7.5 through 69 kv. Can be used for sectionalizing, disconnecting and by-passing applications. Switch has silicone grease lubrication to inhibit corrosion on all rotating points. Terminal clamps are adjustable.

Single Switch Tester

(14) Knopp Inc., 4224 Holden, Oakland, Calif.

Use of a Mossman heavy-duty lever switch on this company's watt-hour meter tester provides single switching for testing, therefore helping to eliminate error and speed up tests. The new switch is on latest models of the testers.

Circuit Breakers

(15) I-T-E Circuit Breaker Co., 19th & Hamilton Sts., Philadelphia 30, Pa.

This company has developed and tested circuit breakers in anticipation of three new higher industry standard ratings for metal-clad switchgear. For 13.8 kv. 1,200- and 2,000-amp applications, new units are available with an interrupting rating of 750 mva. They require no greater stationary structure than 15-kv units with 500 mva interrupting capacity. For 4.16-kv applications a new unit has a 350-mva interrupting rating with continuous current rating of 3,000 amp for mains and bus ties or of 1,200 amp for feeders. Also for 4.16 kv is a unit with an interrupting rating of 75 mva.

Molded Plastic Bolt

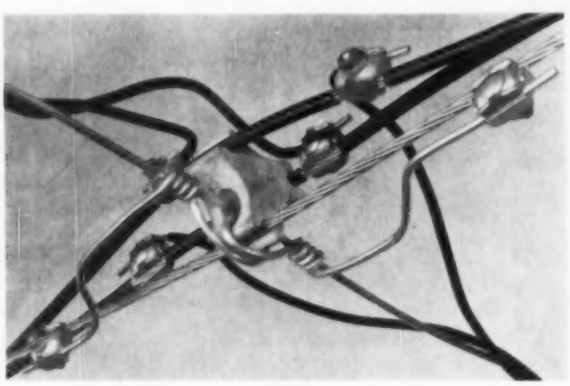
(16) Hendrix Wire & Cable Corp., 19 Watson St., Boston 18, Mass.

Plastic bolts designed for use with this company's plastic aerial cable clamps require only hand tightening and take the last metal part out of the electrostatic field. The bolts have wings on bolt heads for hand grabbing.

Reel Trailer

(17) Utility Equipment Inc., 13 Eureka St., Buffalo, N. Y.

Cable reels can be loaded and transported by one man with the use of these new trailers, according to the manufacturer. Loading gear consists of specially designed arms that pick up reels, and, with the aid of a winch, place them on rail racks on the trailer. Reels can be revolved for dispensing cable. Three- and five-ton models are available, with tandem wheels and two axles on the larger.



Cable Separator

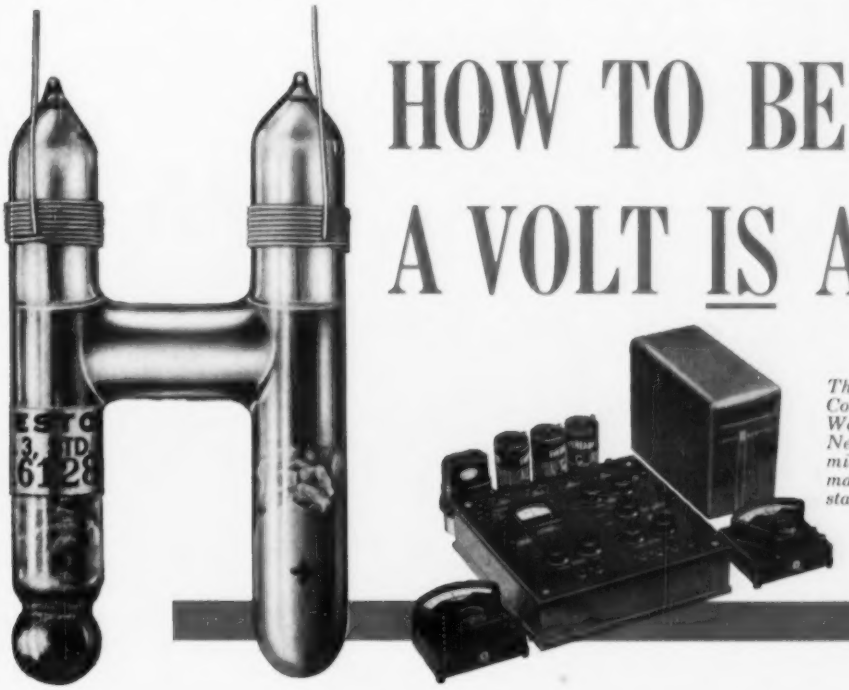
(18) Porcelain Insulator Corp., Lima, N. Y.

This new product is a triplex cable separator for midspan service taps. The insulator is made of porcelain and will accommodate up to a 2/0 triplex cable. Designed for use with either solid or stranded supporting cable.

For More Data Fill in Coupon on Page 30

DRIVER-HARRIS ALLOYS AT WORK IN PRODUCT ADVANCEMENT

HOW TO BE SURE A VOLT IS A VOLT...



The Weston Standard Cell Comparator Model 1000, made by Weston Electrical Instrument Corp., Newark, N. J., with associated milliameters, dry cells, main galvanometer, and auxiliary standard cell.*

This H-shaped object, the saturated or "normal" form of the Weston Standard Cell, is the standard reference for electrical measurements. It is essentially a mercury cadmium wet cell hermetically sealed in glass. When kept at 20 degrees C., it maintains a voltage of 1.018636 volts for years. A bank of these cells at the Bureau of Standards in Washington, kept under oil at a constant temperature, is the basic electrical standard of the United States. This, however, is not the cell used by scientists and engineers in their daily work. Since the normal cell must be maintained at a constant temperature for accurate results, the unsaturated or "working" cell, which is portable and is not materially affected by temperature, is ordinarily used.

These working cells must be periodically checked against a bank of normal cells through the use of a comparator system. In the past only a few comparators existed outside the Bureau of Standards. However, the Weston Electrical Instrument Corporation has produced a simplified Standard Cell Comparator which provides the user of working cells, in conjunction with his own bank of temperature controlled normal cells, with an accurate means of standardizing these right in his own plant . . . at a great saving in time, cost and convenience.

THE WESTON COMPARATOR

The Weston Standard Cell Comparator is a specialized potentiometer wherein the voltage of a working cell under test is opposed to that of a normal cell to produce a voltage difference which, when added algebraically to the normal cell voltage, indicates directly the voltage of the cell under test. With a known normal cell voltage as a reference, the Comparator will measure to well within 5 microvolts the open circuit voltage of any cell in good condition.

With an instrument calibrated to such excellent accuracy as this one, it is worthy of note that Weston uses Driver-Harris Manganin wire for critical resistance networks in its system. Says Weston: "The success of the entire circuit, given accuracy of adjustment, depends upon the permanency of the Manganin, and upon its extremely low temperature coefficient of resistance and its low thermal emf to copper".

Your work may or may not need the extreme degree of accuracy that is a prerequisite here. Either way, Driver-Harris has an alloy that can reliably fill your needs. Manganin is only one of 112 special purpose alloys, produced by Driver-Harris. And each of these was originally custom-made . . . produced exactly to the specifications of someone who needed it. Put your specifications in our hands. You will gain the benefits of the 57 years of experience which has developed the largest variety of alloys ever made by any one company.

*A subsidiary of Daystrom, Inc.

Driver-Harris COMPANY HARRISON, NEW JERSEY

Western Representative: ANGUS-CAMPBELL, INC. • 4417 S. Soto St., Los Angeles 58 • 760 Tennessee St., San Francisco 7

MAKERS OF THE MOST COMPLETE LINE OF ELECTRIC HEATING, RESISTANCE, AND ELECTRONIC ALLOYS IN THE WORLD

Angle Crossarm Sheave

(19) T. J. Cope Inc., Third Ave. & Walnut St., Collegeville, Pa.

A new angle crossarm sheave for pulling cable around corners is announced by this company. It is adjustable to any angle up to 90°. Two sizes are available, one for cable up to 3 in. diameter, the other up to 4 in. They are made of aluminum or malleable iron, and are fitted with Oilite bushings to reduce friction.

Batteries

(20) H. R. Kaewert, U. S. Sales Representative, 750 Natoma St., San Francisco 3, Calif.

Electric utility applications of these new British-made nickel cadmium batteries include tripping and closing service, diesel starting units, emergency power and instrumentation. Battery is supplied in three basic types: low discharge units for application where the current demand is for a period longer than 10 hours; medium discharge units for use in tripping service, emergency lighting, etc.; and high rate discharge for starting internal combustion engines and other applications where current is required for less than an hour. Literature available.

Secondary Capacitors

(21) Line Material Co., 700 W. Michigan St., Milwaukee 1, Wis.

These single-phase, 240-v capacitors, designed for power factor correction on secondary distribution circuits, are reported to meet all NEMA standards. They have an over-all height of $29\frac{1}{16}$ in. and a diameter of 5 in. Units can be mounted with bushings up or down, directly on pole or on crossarm.

Switch Boxes

(22) Keystone Mfg. Co., 23328 Sherwood Rd., Center Line, Mich.

Sectional switch boxes with beveled corners are now available in seven new types produced by this company. Features of the new boxes are: clamps with nested fit for easy wire pulling; knockouts and pryouts designed for fast removal, smooth, embossed ridges for cable rest and adjustable plaster ears with adjustment from 0 to ¾ in.

Compression Joint

(23) Reliable Electric Co., 3145 Carroll Ave., Chicago 12, Ill.

Colored plastic caps over each end indicate the size of these new all-aluminum service entrance compression sleeves. Available in five sizes, each compression sleeve has a solid center barrier that locates the conductor correctly, and each of the two compartments is filled with grease at the factory. Sleeves are clearly marked for size and number of compressions. A new compression tool with three dies is also available. Ask for free samples of the sleeves.

Compression Tool

(24) James R. Kearney Corp., 4236 Clayton Ave., St. Louis 10, Mo.

This company announces a new tool for making compression connections on open wire distribution lines. It has removable indenting dies that compress Squeezon tap connectors through line wire sizes 4/0 ACSR to stranded aluminum, and line splicing sleeves through 4/0 stranded aluminum or 2/0 ACSR and stranded copper. A fixed die in the nose of the tool compresses service entrance sleeves and L taps. Two models of the tool differ only in the size of the fixed die.

Cable Reel Jack

(25) T. J. Cope Inc., Third Ave. & Walnut St., Collegeville, Pa.

Redesigned for greater efficiency, this cable reel jack is ratchet operated and designed for underground cable installation use. It will accommodate up to $2\frac{3}{8}$-in. spindles and has a capacity of 10 tons. Each pair of jacks weighs 130 lb.

Panel Enclosure

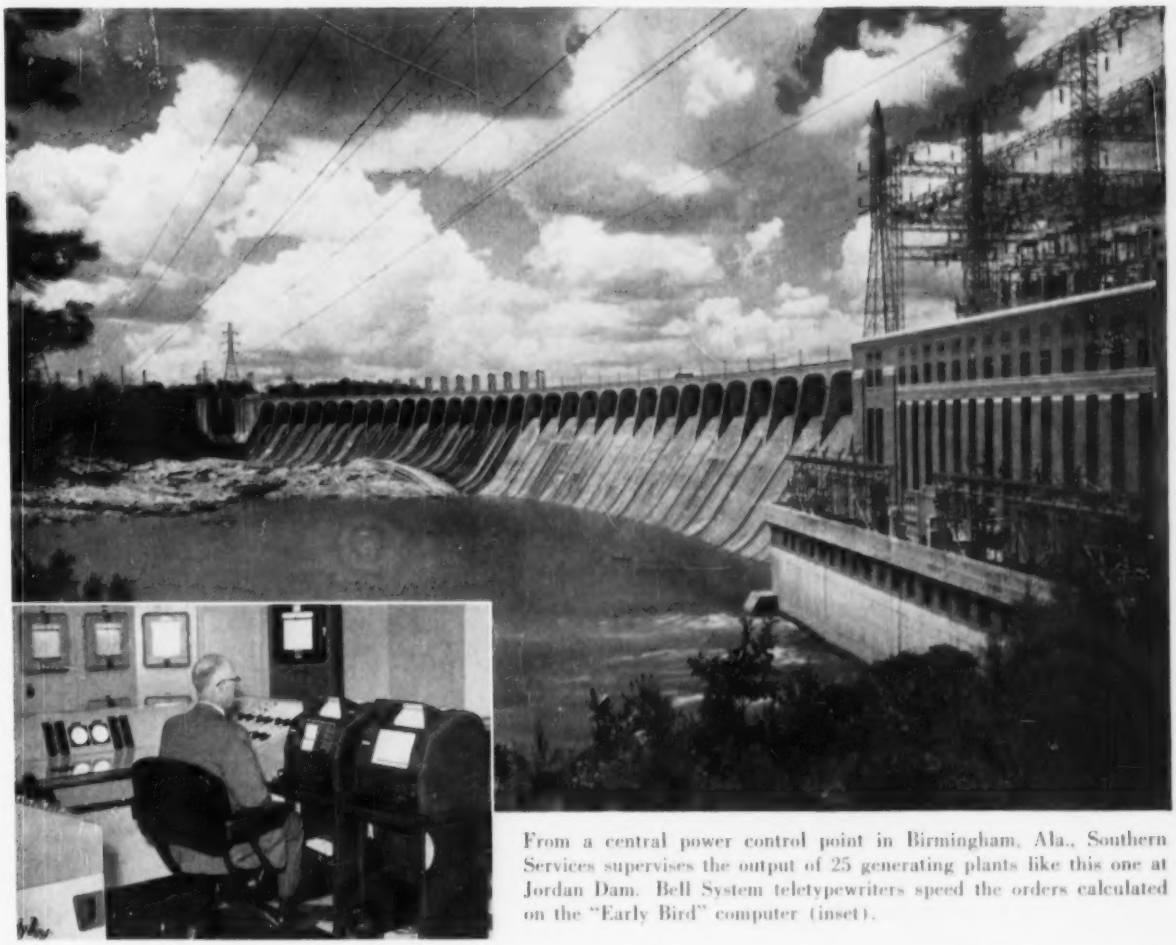
(26) Hoffman Engineering Corp., 1674 Tyler St., Anoka, Minn.

Eight sizes of two-door NEMA 12 panel enclosures have been added to this manufacturer's single-door line. The steel, liquid-tight enclosures have welded seams and no center post, and doors are gasketed with neoprene sponge. Interior is finished with baked white enamel—exterior with prime coat. Sizes range from 54x42x8 in. to 72x60x12 in.

Entrance Mast Seal

(27) McCaffrey Mfg. & Supply Co., 1840 W. 14th St., Chicago 8, Ill.

A new weather seal for service entrance masts now on the market is said to eliminate the necessity for caulking. The unit is made up of a seamless base of aluminum, copper, lead or zinc plated steel. The base is adjustable to all standard roof lines from flat to 45°. A neoprene weather seal fits the contour of the base. Available in sizes to fit 1¼-, 1½-, 2- and 2½-in. rigid conduit. Can be used with or without a clamp.



From a central power control point in Birmingham, Ala., Southern Services supervises the output of 25 generating plants like this one at Jordan Dam. Bell System teletypewriters speed the orders calculated on the "Early Bird" computer (inset).

How Bell System teletypewriter works with Southern's computer

Seated at the "Early Bird" computer in Birmingham, Ala., headquarters of Southern Services, Inc., the power co-ordinator transmits generating orders for 25 plants—by Bell System teletypewriter.

This close supervision contributes to more economical power supply to consumers in Alabama, Georgia, Mississippi, Florida. Power output, cost of power and transmission losses are figured continuously by the analogue computer. When load adjustments are necessary, Southern's co-ordinator sends the orders by private line teletypewriter.

Bell System service gives Southern speed, accuracy and dependability. And teletypewriter communications provide a day-to-day record of orders transmitted.

. . . .

Bell System private line service can make communications faster and more efficient for you. Call your Bell Telephone representative. He will be glad to study your needs.

BELL TELEPHONE SYSTEM

PRIVATE LINE TELEPHONE • PRIVATE LINE TELETYPEWRITER

CHANNELS FOR: DATA TRANSMISSION • TELEMETERING • REMOTE CONTROL • TELEPHOTOGRAPH • CLOSED CIRCUIT TV

THE TIME PROVEN

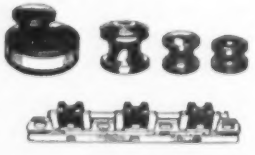
1929

FOR YEARS...
THE UNCHALLENGED
LEADER IN ITS CLASS

THE PORCELAIN PRODUCTS 1929 WIREHOLDER IS THE "STANDARD", BECAUSE OF:

Good Basic Design √
Sound Engineering √
Uniform High Quality √
Competitive Pricing √
Dependable Service √
Up-to-date Packaging √

Plus a complete, quality line of secondary service materials!



62 Years

Electrical Porcelain Since 1894.

PP INC

Porcelain Products, Inc.
FINDLAY, OHIO

BULLETINS ETC.

(28) CATALOG—Holub Industries Inc., Sycamore, Ill., has published a new catalog that lists more than 400 items in the "Hi" line of electrical and mechanical products and equipment. Ask for catalog No. 12.

(29) INDUSTRIAL LIGHTING—Descriptions, illustrations and data on 394 Benjamin industrial fluorescent lighting units are in bulletin B, now available from Benjamin Electric Mfg. Co., Des Plaines, Ill.

(30) TRANSFORMER INSTRUCTIONS — Forms DL-1 and 427-R-1, available from Moloney Electric Co., are instruction booklets on power and distribution transformer maintenance and operation. Covered are installation, operation, component parts and inspection. Write to the company at 5390 Bircher Blvd., St. Louis 20, Mo.

(31) REPLACEMENT PARTS—A 40-page catalog available from Automatic Service Supply Co., 210 E. Baltimore, Detroit 2, Mich., lists replacement parts for all makes of automatic washers and dryers. Contains specification chart showing the size venting and adapters needed by make and model numbers.

(32) CABLE BRUSH—A new glass fiber brush to use for preparing contact surfaces of aluminum conductor for connections is described in a bulletin published by Rush Wire Stripper Division, Eraser Co. Inc., 1068 S. Clinton St., Syracuse 4, N. Y. The company has available a series of bulletins entitled "Reliable Electrical Connections" describing equipment and applications.

(33) TROLLEY BUSWAY—Major components are pictured and advantages described in this new booklet about a lightweight, heavy-duty trolley busway system of Delta-Star Electric Division, H. K. Porter Co., 17th and Cambria St., Philadelphia 32, Pa.

(34) CIRCUIT BREAKERS—Federal Pacific Electric Co., 50 Paris St., Newark 1, N. J., has issued a 20-page bulletin about new types of AB-1 enclosed circuit breakers with 600-v ratings ranging from 15 to 600 amp. The new StABreakers are featured.

(35) INFRARED BROODER—A new single-lamp brooder for 80-100 chicks is described in bulletin 130-57 of Steber Mfg. Co., 2700 Roosevelt Rd., Broadview, Ill. The same brooder lamp can be used for pigs, lambs and calves. The booklet also carries information of the rest of the company's infrared brooder line.

(36) UTILITY TRUCKS—More than 20 custom-engineered utility applications of FWD four- and six-wheel-drive trucks are given in a brochure available on request. Write to Utility Division, Four Wheel Drive Auto Co., Clintonville, Wis.

(37) POTHEADS—Complete data on single conductor, cap nut potheads for paper or varnished cambric, lead covered cables and rubber insulated, neoprene jacketed cables are carried in bulletin AB56 published by G&W Electric Specialty Co., 3500 W. 127th St., Blue Island, Ill.

(38) FUSE LINKS—Bulletin FC5 of Line Material Co., 700 W. Michigan St., Milwaukee 1, Wis., describes the company's complete new line of fuse links, including types K and T. Dimensions, time-current curves, construction features and application information are included.

KILL TWO BIRDS WITH ONE STONE—Fill out this coupon and get back valuable information from as many sources as you indicate.

ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

Not good after March 1

Please send me, without obligation, the new product information or catalogs:

If described in Product News, circle item number

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

If described in advertising, fill in page number

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

NAME ..... TITLE .....

COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

*Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

● Derrick and digger are unaffected by ground obstacles. Suspending the digger from the winch line, the full length of the derrick is utilized for reaching over this fence.

● Equipped with a Tel-E-Lect FLD (Fold Over Derrick Storage Kit) this truck can be readied automatically for work or for over-the-road travel in a few minutes.

Power IN THE STRETCH!

TEL-E-LECT...takes it out from under the hood...puts it into the ground

● **Unleash any power-packed TEL-E-LECT-equipped utility truck** and you have a real tiger for digging pole holes, regardless of soil conditions. Tel-E-Lect products are designed to get the most out of your present truck. *They convert energy under the hood into profitable performance on the ground.* Because they are specially engineered for your kind of work, you can do a better job and do it faster and cheaper!

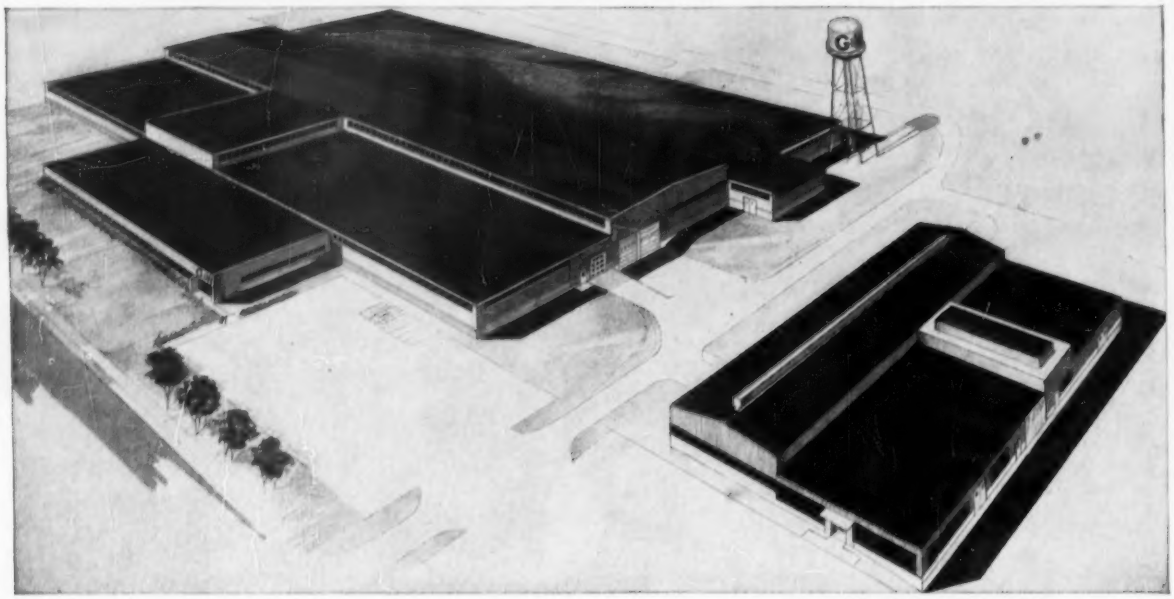
● **Reachability:** Tel-E-Lect equipment works from any angle . . . up hill, down hill, across fences and over other obstacles. Digger-derrick units can be readied for work in two minutes and with complete safety; no legs to set, nothing to assemble. Move a single lever and the digger is ready to work.

● **Mounts on any Truck:** "A" or "T" frame *Self-Storing* derricks for either front or rear operation are available for most popular trucks. Your own mechanic can convert your truck into an efficient, profitable utility rig in a few hours.

Consult your local phone directory for the nearest Tel-E-Lect distributor or write:

TEL-E-LECT PRODUCTS, INC.
10023 MINNETONKA BLVD.
MINNEAPOLIS 26, MINNESOTA

Manufacturers of Winch & Digger Drive Systems ● Mechanical and Hydraulic Derricks ● Derrick Storage Kits ● and Utility Truck Bodies



G&W has moved to a new plant

with increased production facilities to give you BETTER SERVICE on cable accessories

Your orders have made this move possible and we appreciate your business.

To better take care of your requirements for our products, we built this larger factory on a new site which has plenty of room for expansion.

We shall continue to specialize in the design and manufacture of CABLE TERMINATING, INTERCONNECTING AND SECTIONALIZING DEVICES for trouble-free, flexible electric distribution systems.

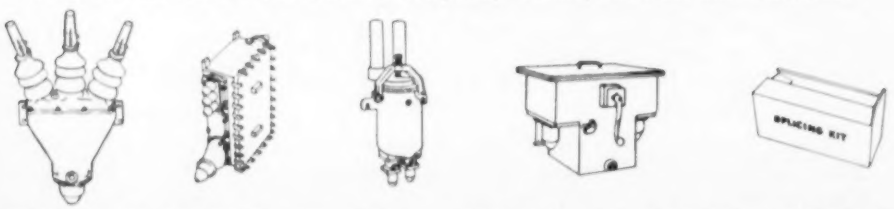
G & W ELECTRIC SPECIALTY COMPANY
3500 W. 127th ST., BLUE ISLAND, ILLINOIS

Telephones: (CHICAGO) INterocean 8-5255 to 5259. (BLUE ISLAND) FUlton 8-5010 to 5013
Telegrams: IBT TWX System Code: Blue Island 153, Also Western Union

Representatives in Principal Cities of N. & S. America

Canadian Affiliates — Powerlite Devices, Ltd., Toronto, Montreal and Vancouver

G561



POTHEADS...CABLE BOXES...OIL FUSES...LOAD BREAK OIL SWITCHES...SPLICING KITS

ELECTRICAL WEST SALES GUIDE®

News Letter

JANUARY 1957

FOR THE ELECTRICAL MERCHANT OF THE WEST

Trend is upward

Four electric appliances experienced increased sales ranging from 15% to almost 300% in 1956 as compared with 1955, according to NEMA officials. While shipment of standard electric ranges, refrigerators, freezers and storage water heaters were off from 3 to 15%, sales of dehumidifiers almost tripled; built-in range sales almost doubled; dishwashers were up 35%; food waste disposers almost 15%. The trend to built-in ranges is expected to climb in 1957 and sales of the other three appliances will continue upward. Refrigerators, freezers and storage water heaters will recover some of the loss experienced in 1956, it is believed, and will furnish the real strength of the business picture next year for the major electric appliance industry.

Winter Market Feb. 4-8

Those who attend the **Western Winter Market's Radio, TV and Appliance dinner** on Wednesday, Feb. 6, at San Francisco will see the 1957 Live Better . . . Electrically film. Frank Falge will speak for the electrical industry and the LBE anniversary show will have its second viewing in the area (only prior one is the live closed circuit telecast on Jan. 30). Promised for Market Week—Feb. 4-8—are many new devices, improved designs and lots of color. Housewares will be featured at the Pot & Kettle Club's luncheon Feb. 8.

Light for selling

A practical demonstration of the use of lighting in merchandising will be another feature of Market Week in San Francisco. The Store Lighting Clinic will be sponsored by the Northern California Electrical Bureau, PG and E, and the Western Merchandise Mart; will be held the entire week in Space 490.

Industry promotions

The residential promotion committee of Edison Electric Institute, 420 Lexington Ave., New York 17, N. Y., is out with its **residential promotional program for 1957** and starts off with electric dryers for January, February and March with the theme "From Where I Sit, Clothes Dry Better Electrically." Promotional kits are available. Live Better . . . **Electrically** has made available an electric dryer promotion kit, 4 newspaper ad mats for utilities, 6 small drop-in mats for dealers, 4 suggested radio scripts, a descriptive folder. Also a new 50-second TV spot using the same theme, "From Where I Sit Clothes Dry Better Electrically." Live Better . . . **Electrically** advertising will feature electric drying.

OHI symbol

Oscar Ohi, a copyrighted symbol for Operation Home Improvement, is being offered with the campaign's 1957 display and advertising kit, available from OHI headquarters, 10 Rockefeller Plaza, New York 20, N. Y.

Heat pump data sheets

Data sheets on residential and commercial heat pump installations have been compiled in booklet form by EEI and are available at $2 for member companies and $3 for nonmembers. Order from Commercial Department, Edison Electric Institute, 420 Lexington Ave., New York 17, N. Y.

$64,000,000 guestimate

What LBE is doing for advertising media all over the country was told at a recent San Diego Ad Club luncheon sponsored by California Electrical Works, with Pinky Knight as the instigator and Bea Knight, chairman of the day. Each representative estimated what had been spent in his media by those cooperating in the program. Guestimate was $64,000,000 with nobody getting less than $3,000,000. This meeting provided unification at just the right time and gave a boost to enthusiasm in the industry as well as among the advertising people of the area.

Edison brochure tells story

To push its laundry campaign, Edison has issued the second of its tabloid-size LBE brochures. With attractive format and a cover whose desert scene suggests dryness, the publication tells the washday program, point by point. A picture comparison shows the old and the new way to wash clothes. As a part of the campaign, the utility sent clothes pins to dealers to use in store promotion. The first LBE tabloid was issued in October to push the company's electric range campaign.

Cost calculator

Los Angeles Department of Water & Power has a handy cost calculator for electric appliance operation. Built around the theme, "It costs so little to have an all-electric home," the pocket-size booklet shows in easy to figure form the cost of operating different appliances if present monthly bill is . . . (anywhere from $1.75 to $10.35) and kwh usage is . . . (from 50 to 600 kwh). The inside back cover gives rate information for domestic service; the back cover has wattage rating and estimated average annual kwh consumption of household appliances, assuming normal use.

Electric heat

"Are You Considering Electric Heat?" is the title of a new customer information booklet issued by Seattle City Light. Aimed at home owners planning a heating system, it gives information on installation of equipment, insulation, comparative cost and electric rates.

New kitchen

A demonstration electric kitchen is a feature of the new $356,000 San Fernando Valley district commercial office of the Department of Water & Power at 6550 Van Nuys Blvd. The kitchen is in an auditorium that seats 150 persons and will be used for group meetings. Manufacturers' displays set up in the kitchen and around the main office will be rotated.

Sales boosters

In its blanket promotion, San Diego Gas & Electric used a red and white "Get Up and Go" button to invite questions and lead right into the sales talk. It has found testimonial-type ads effective in pushing ranges, ran a series built around 15 homes in five districts, and for TV is trying the theme that "it takes more than one to keep the home happy." The ever-popular Weatherword program ties in with any promotion and the utility is now offering through dealer stores a pocket-size booklet giving weather data and defining terms used on the program.

New officers

Election time is here for a number of electrical industry organizations. New officers chosen by the Los Angeles Electric League, reports Glen Logan, managing director, are: president, **Edward Marten,** manager of Westinghouse Electric Supply Co.; executive vice-president, **Stan Everett,** Everett's Television; secretary, **Floyd Lovelace,** Los Angeles Department of Water and Power; and treasurer, **Bob Thompson,** general sales manager of Packard-Bell. In addition, the league elected 16 new directors.

Airport store

Bob Leonard has opened Leonard's International near the airport at Los Angeles. He has 41,000 sq ft in a hangar-like building; is handling about 10 appliance lines. He has several other outlets in the Los Angeles area.

Norge to Graybar

Appointment of Graybar as Norge distributor in southern California succeeding Sues, Young & Brown has been confirmed. Headquarters are at 210 Anderson St., Los Angeles, with branch operations at 800 W. 16th St., Long Beach, and 655 S. H St., San Bernardino.

Lines move

J. N. Ceazan, Los Angeles, has taken over the Easy and Gibson lines to replace Bendix. No immediate changes are planned in the sales force, according to **Mose Katzev,** advertising manager, but dealer system for the two lines will be reviewed, he said. A campaign to build up the dealer organization will include a contest in which winners can write their own tickets to Honolulu, New York or Acapulco. Katzev indicated that Ceazan is negotiating for other lines.

Other changes

Other changes in the Los Angeles area resulting from sale of Bendix to Philco were reported by **Darwin Sjolseth,** former factory representative and southwest zone manager for Crosley-Bendix. He himself has gone with Philco as sales manager for the Bendix line. Several new salesmen have been added. Among them are **Sam Bravrman,** from Ceazan; **Ray Cuibord,** from Sues, Young & Brown, **Saul Weingart,** from Lighthouse, Lamp & Shade, formerly SYB, **Larry Weiss,** from Ceazan, **Richard Halverson,** Duluth, Minn. Sjolseth said that Philco planned to go along with the Bendix dealer setup; that Philco dealers would take on the Bendix line too.

NuTone has opened larger offices at Los Angeles. Located at 237 W. 30th St., the new quarters have 10,000 sq ft of floor space. **F. B. Marple,** vice-president and Western sales manager, is headquartered there.

New offices

Landers, Frary & Clark has bought a controlling interest in Ever-Bright of Toronto, maker of electric appliances and housewares. Production of some Universal items at the Toronto plant will supplement Ever-Bright output.

Buys interest

Paul Garrett, vice-president of General Motors, who has been a frequent Western visitor with the Frigidaire Dream Kitchens and other G-M events, retired Dec. 31 and has opened his own public relations office in New York . . . **Wendell Fields Jr.** will cover New Mexico for American Kitchens Division, AVCO, as part of his new duties as Southwestern regional sales manager. Headquarters are in Dallas, Texas . . . **Donald E. Reed,** Stanton-Reed, Alhambra, Calif., has been elected president of the 1957 Construction Industries Exposition and Los Angeles Home Show.

About people

Winston L. Hunt is new general commercial manager of Public Service Co. of New Mexico. The new job is added to his duties as purchasing agent.

Added duties

Dorothy S. Huse, home economist for Sues, Young & Brown until it gave up Norge and its white goods business, is now on TV with her own program. Sponsored by Von's Markets, the five-minute "Menu of the Day" is on five days a week. She plans to do commercials for other food products, laundry supplies and major and small appliances.

Her own program

A Westerner was top winner in Frigidaire's recent "best seller" contest. Richard Biggs of Leonard's Airport Village, Culver City, Calif., outsold Frigidaire retail salesmen during the 6-week national promotion.

Best seller

Betty P. Herzfeld has been appointed Waste King Corp.'s consumer relations coordinator in the San Francisco Bay area. She was formerly with Good Housekeeping magazine . . . **Bob Ann Taylor** has been named Norge home economist in nine states, including Colorado and Mexico . . . **Luci LaFontaine,** formerly with G-E Supply in Oakland and more recently with California Electric Supply, is now home economist for Calgon in the San Francisco and Los Angeles areas . . . **Frances Alexander,** Crosley-Bendix home economist at San Francisco, has gone with Philco and has been transferred to Portland.

With the home economists

Hints on use of detergents in automatic laundry equipment were given by **Dorothy L. Hogg,** Colgate-Palmolive Co. field representative, during a recent visit to the Pacific Coast. Ratio of automatics to conventional laundry equipment is four to one in this area, she pointed out. Nationally usage is two-thirds conventional; one-third automatic.

Coast visitor

The new Kelvinator line was shown to dealers and the press at the company's Oakland office on Dec. 15. New colors being featured this year on the line are village green and autumn rose. Shown by **Jack Daly,** sales promotion manager, refrigerator models have new convenience in door storage, including removable egg crates; and in freezer arrangement on combinations. Chest freezers are back in the line after two years' absence and are being shown along with upright models. A dishwasher has been introduced this year and is available with glass front for dealer displays. The 1957 Fooderama and the electronic oven were big features of the showing.

Line shown

TV models using the new 110° magnetic deflection picture tube have been introduced by Sylvania. The sets are up to 4 in. shorter from front to back and 5 lb lighter than comparable 90° tube models.

New tube

In a move to make its air conditioners competitive in every market, Westinghouse will let distributors set suggested list prices for their dealers. The factory will issue a distributor cost sheet showing suggested lists for guidance only. On July 15, 1957, the manufacturer will buy back from dealers, through distributors, a number of room air conditioners equal to that purchased and accepted in the period January through May 1957. Purpose of this program is to encourage nonseasonal buying, bring steady production.

New deal

Effective Jan. 1, **G-E cut prices of 15 transistor models** used in portable radios, phonographs, hi-fi equipment. Reductions are from 9 to 17%.

Prices cut

Frank Falge's monthly progress report on

LIVE BETTER . . . *Electrically*

Closed-circuit telecast on Jan. 30 launching the second year of Live Better . . . *Electrically* will be sponsored by Pacific Gas and Electric Co. in San Francisco, San Diego Gas & Electric Co. in San Diego, Arizona Public Service, Salt River Power District and Appliance Manufacturers Assn. in Phoenix, Sacramento Municipal Utility District and Sacramento Electric Club in Sacramento, Washington Water Power Co. in Spokane, Utah Power & Light Co. in Salt Lake City, Seattle City Light in Seattle, and Pacific Power & Light and Portland General Electric in Portland. These and other utilities are making plans for kinescope meetings to follow, beginning Feb. 15.

Second telecast on Jan. 30

Live Better . . . *Electrically* is catching on fast. Manufacturers of promotional items now offer drapery material, wall paper, ash trays, match folders, brief cases, pencils, bottle caps, key holders, calendars, 24-sheet posters, car cards, truck signs, bumper stickers, decals of every size and description, illuminated counter signs, scotchlite stickers, calling cards and label stickers.

Everyone is getting in the act

All signs point to a tremendously successful National Electrical Week Feb. 10-16. In northern California the Northern California Electrical Bureau and Pacific Gas and Electric Co. are sponsoring a $20,000 prize award activity similar to the very successful one held in 1954, which brought in 106,000 entries. A complete setup of subcommittees is at work, including speakers, open house, proclamations, etc., in line with the new Plan Book available from the National Electrical Week committee, 290 Madison Ave., New York 17, N. Y.

Off to a good start

That people do want to Live Better . . . *Electrically* is shown by an area in eastern Washington in which natural gas is now entering, where an oil company representative reported that 8 out of 10 people who are discarding oil heat are changing to electric heat.

8 out of 10 change to electric heat

At San Diego Gas & Electric Co., they clip the dealers' ads from the newspapers and on those not carrying Live Better . . . *Electrically* they paste a Live Better . . . *Electrically* emblem and slogan and return it to the dealer as a suggestion for future ads. Result—people in San Diego know about Living Better . . . *Electrically.*

Best idea yet

Following a Kiwanis Club meeting at which the Kiwanians were told about the story of Live Better . . . *Electrically*, the proverbial joker got up and asked why, on the rostrum, the house had a chimney if the people lived better electrically. The quick-thinking chairman replied without a moment's hesitation, "What would you do about Santa Claus?"

Don't kill Santa Claus

But after you've read this page look at the back cover. Let's pull together is the theme PCEA will be talking about in forthcoming issues. If we all pull together our objectives for 1960 will be easily realized and surpassed.

Don't look now!

Allis-Chalmers, Westinghouse, Thermador, Magna Engineering, Simplex Wire & Cable, Hotpoint, Hubbard & Co., Okonite and Kuhlman are a few of the manufacturers actively helping to put over Live Better . . . *Electrically.*

Kudos to manufacturers

Thermador liked the catchy rhythm of the Live Better . . . *Electrically* theme song so they made up new words appropriate to their sales problem and use the ditty on their radio program.

Uses LBE theme song

The big Housepower promotion will continue through 1957. The 1957 plan books are now available.

HOUSEPOWER

ADVANCED DESIGN

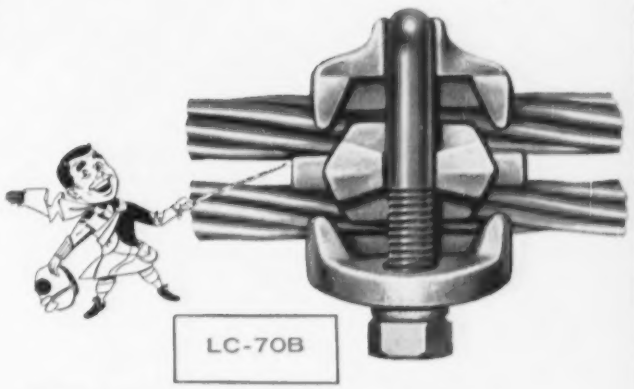
- LONGER CONTACT LENGTH
- ASSURED INHIBITOR PROTECTION
- REDUCED CABLE DISTORTION

ANDERSON ALUMINUM PARALLEL GROOVE CONNECTORS WITH "COVER ALL" SPACER

The illustrations here tell a graphic story of Anderson's progress in aluminum . . . *a 30-year, pioneering span of bed-rock engineering* . . . to give the electrical power industry the products to *most efficiently* meet growing demands.

The new, advanced design of these U-bolt type parallel groove connectors accomplishes *ALL SIX OF THE SOUGHT-FOR MAJOR REQUIREMENTS!* (1) More efficient cable contact. (2) Increased pull-out strength. (3) Protection for inhibitor. (4) Maintains cable configuration by completely enclosing and protecting it. (5) Extended spacer helps to speed installation. (6) Greater range without sacrifice . . . due to advanced design of of spacer . . . reduces stocking.

Ask your ANDERSON Representative to give you the complete facts . . . test data . . . ratings . . . and cable ranges of these new connectors. Or, write to our home office.



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Aluminum and Bronze POWER CONNECTORS • CLAMPS • FITTINGS • ACCCESSORIES for SUBSTATION • TRANSMISSION • DISTRIBUTION

ANDERSON ELECTRIC

CORPORATION

BIRMINGHAM 1, ALABAMA

ELECTRA'S HUSBAND

Good Resolutions

SURPRISINGLY enough, the round table at the club had almost its full complement of "regulars." Generally the period between Christmas and New Year's finds several members with urgent business responsibilities near Palm Springs, Phoenix or Pasadena. And, as usual for that time of year, the conversation veered around to the amount and results of the pre-Christmas social gaiety.

One of the members started the conversational ball bouncing by stating: "If I were a man to make New Year's resolutions, I would start in January letting it be known that I was going to politely but firmly decline all invitations to participate in the wassail bowl come next December. The overbounding hospitality of suppliers, customers, prospects and friends is just too much to take for a man of my age. And it raises cain with my calorie counting, too."

"Having accompanied you on a couple of these expeditions into the realms of Bacchus," I said laughingly, "my observation was that you were having too good a time to ever pass them up. Our office party is a case in point where I thought your presence had a particularly buoyant effect."

"Well, your office parties always are a little special," replied my friend defensively, "but I wasn't so exhilarated that I didn't remember that cute little secretary coming up to you and saying, 'You know, Boss, I always thought you were just a little bit stuffy until today.' "

"She's quite new there," I replied hastily. "And besides that just goes to prove the point that office Christmas parties, if they do nothing else, get you a little better acquainted with your co-workers."

"Speaking of calories and good resolutions," this was from one of the more corpulent members of the table, "every year I resolve to limit myself to a 500-calorie lunch every day. Then I proceed to attend about three luncheon club meetings each week and you know what happens. You get to talking and the first thing you know a couple of rolls, all the potatoes and a lovely gooey dessert have disappeared. Somebody ought to start a movement to force the hotels to exercise some sort of dietary control for us weak-willed customers."

"There are probably a lot of things that could be changed to make the plight of the overworked business executive easier," chimed in another of the group. "I wish a lot of so-called protocol could be dispensed with. As a case in point, one company I know has gone all out to give the caller the full treatment. The receptionists are charming and intelligent. They make you feel at home, arrange your appointment as speedily as possible, and make you feel comfortable if you have to wait. On the other hand, if you call one of the executives on the telephone you get a real third degree from his secretary. I did, and after going through the 'who was I, where did I work, what did I want to see him about' routine, guess what happened? She said she was sorry but that he wouldn't return to the office until a week from Monday. It made me so mad I almost resolved to answer my phone myself in the future."

"It's the 'mother-hen' complex and I'll lay a small wager all of us here at the table encourage it in our secretaries by posing as poor, harassed, and imposed-upon mortals," I said philosophically. "But it is annoying and maybe we all ought to resolve to check up on the telephone reception technique in our own organizations."

"If we're going to make resolutions like that," commented a utility regular at the round table, "I suggest we resolve to stop talking to ourselves and make it a point in 1957 to tell the story of our business to all of our friends, neighbors, and our business friends outside. For example, I'm pretty sure that every one of you at this table has spoken before some electrical industry group on one subject or another—but how many of you have ever told the industry's story to a Rotary luncheon or Lion's Club or similar organizations?

"Now National Electrical Week is coming along early in February. Before all these New Year's halos get too badly tarnished, how about my signing you up on the speakers' panel that is going out to the highways and byways to celebrate the event properly?"

"I'd buy that idea," I said. "It would take the heat off me at home to have some good resolutions this year that aren't concerned with overeating, exercise, late poker nights, and other things. Up until this moment I was almost dreading New Year's Day because Electra has an uncanny ability of remembering all the good resolutions I made last year and then asking me what happened to them. Anybody else got some good ideas for 'impersonal' resolutions this year?"

The thin member of the group broke his silence: "I don't have to count calories because I'm what the docs call ulcer-prone from too much worrying. Before the war it was the depression; during the war it was materials; now it's the shortage of manpower. And that's probably because we talked too much to ourselves 15 to 20 years ago, too.

"How about resolving to take a little time personally to sell some of the high school students and college freshmen on aiming at a 60-cycle career. It's way past time for direct action in that area and who's going to take it if people like ourselves don't."

"This gets better and better," I enthused. "Electra will be real surprised if I come out with a list of resolutions like these on New Year's Day."

"Knowing Electra," said the tablemate to my left, "she may be surprised but she won't be speechless—particularly so if you don't follow through any better than is usually the case with good resolutions."

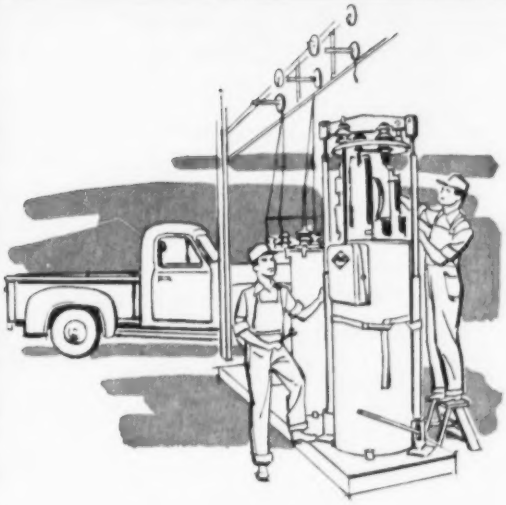
New Year's Day turned out to be better than I had anticipated (or deserved). Electra listened with more than usual patience and less than usual comment to my excuses for not having thought up some Jim Dandy resolutions to improve my conduct. Finally she observed:

"I don't think the resolutions themselves are important—it's the recognition they imply that there's always room to do a better job, individually and collectively."

It's not a bad thought on which to start the new year at that!

Compare Allis-Chalmers Regulators with Others

Slash Regulator Service Costs 75%



THIS

On-the-spot service with Allis-Chalmers cover-suspended regulators—2-man crew and pickup truck does the job without moving unit.

OR THIS

Other regulators usually require a 4 or 5-man crew and boom truck to move regulator and do piecemeal untanking and retanking.

1—Drain oil from tank

2—Remove cover, bushings and control leads

3—Piecemeal untanking

Eliminates need for moving and piecemeal untanking which costs 4 to 5 times more!

This is the key to savings with Allis-Chalmers regulators! Unit construction makes it possible. A 2-man crew using a pickup truck (not a boom truck) can switch the regulator off the line, set up the portable hydraulic jack and in a few minutes lift the entire regulator mechanism far enough out of the tank for inspection. Only Allis-Chalmers regulators provide full unit construction.

For complete information, call your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

LIVE BETTER ELECTRICALLY

ALLIS-CHALMERS

A-C

A-5139

An answer for every electric utility

A PLANNED OUTAGE IS NO OUTAGE

Five hundred kw is not a large unit of power by utility standards. Not, that is, unless it is badly needed . . . and not available.

That's why more and more utilities are finding an increasing number of uses for the Electro-Mobile 500 kw highway-trailer generating unit. It can go anywhere, pick up a load in minutes, permit construction or maintenance crews to work without interrupting service to customers.

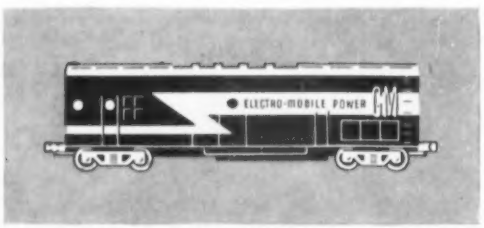
In addition, Electro-Mobile Power offers an immediate source of emergency power to areas that might otherwise be without service for a long period of time. Used in multiple, there is no limit to the amount of power these units can supply.

The savings from Electro-Mobile Power are many. Rebuilding or maintenance work of any duration can be handled during regular working hours. Work goes faster, in greater safety, and most important—customer relations and income are maintained during the temporary outage.

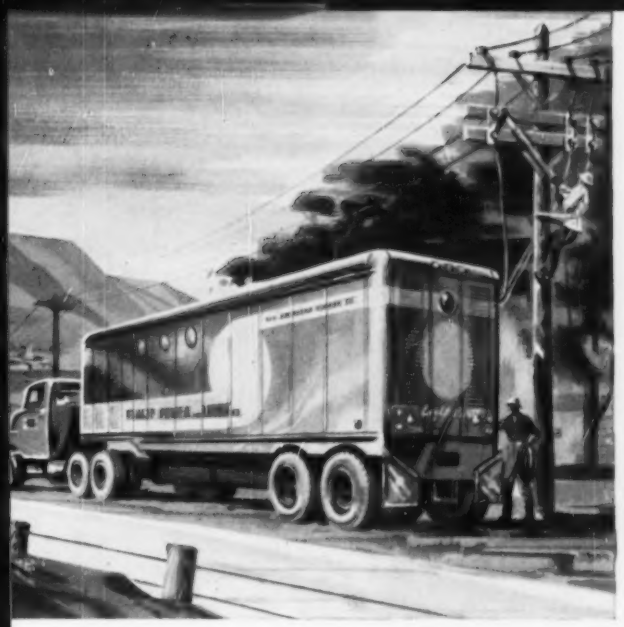
A planned outage is no outage with Electro-Mobile Power. Its many advantages are helping to reduce costs and improve service for many utilities. It can do the same for your system. Your Electro-Motive representative will be glad to show you how.

Here's how one Midwestern utility company uses its Electro-Mobile trailer . . .

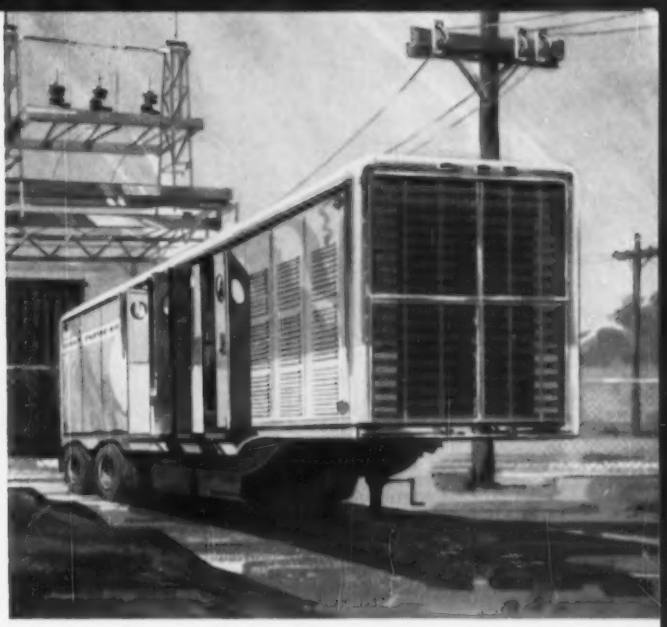
In a span of twelve months, this utility used its Electro-Mobile trailer on fifteen different jobs. Shown here are some examples of the work completed and in progress with this unit. During the year the mobile trailer was operated over 340 hours. On one job alone, it was used 145 hours, delivering 58,500 KWH.



Rail Car—develops 1,000 kw. For use on rail sidings or placed on piers for semi-permanent installation.

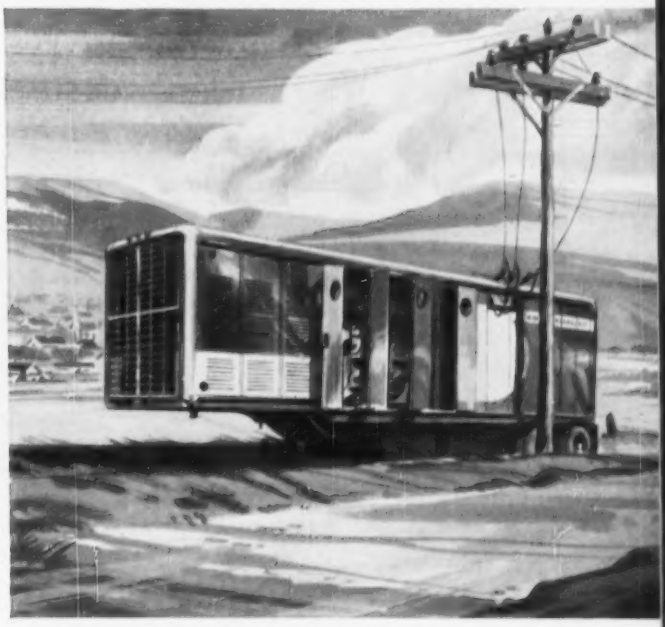


Relocating 12,400-volt line for new highway.
Hours used: 68 ¼ KWH generated: 22,700



Installation of new transformer for substation.
Hours used: 3 ½ KWH generated: 1,100

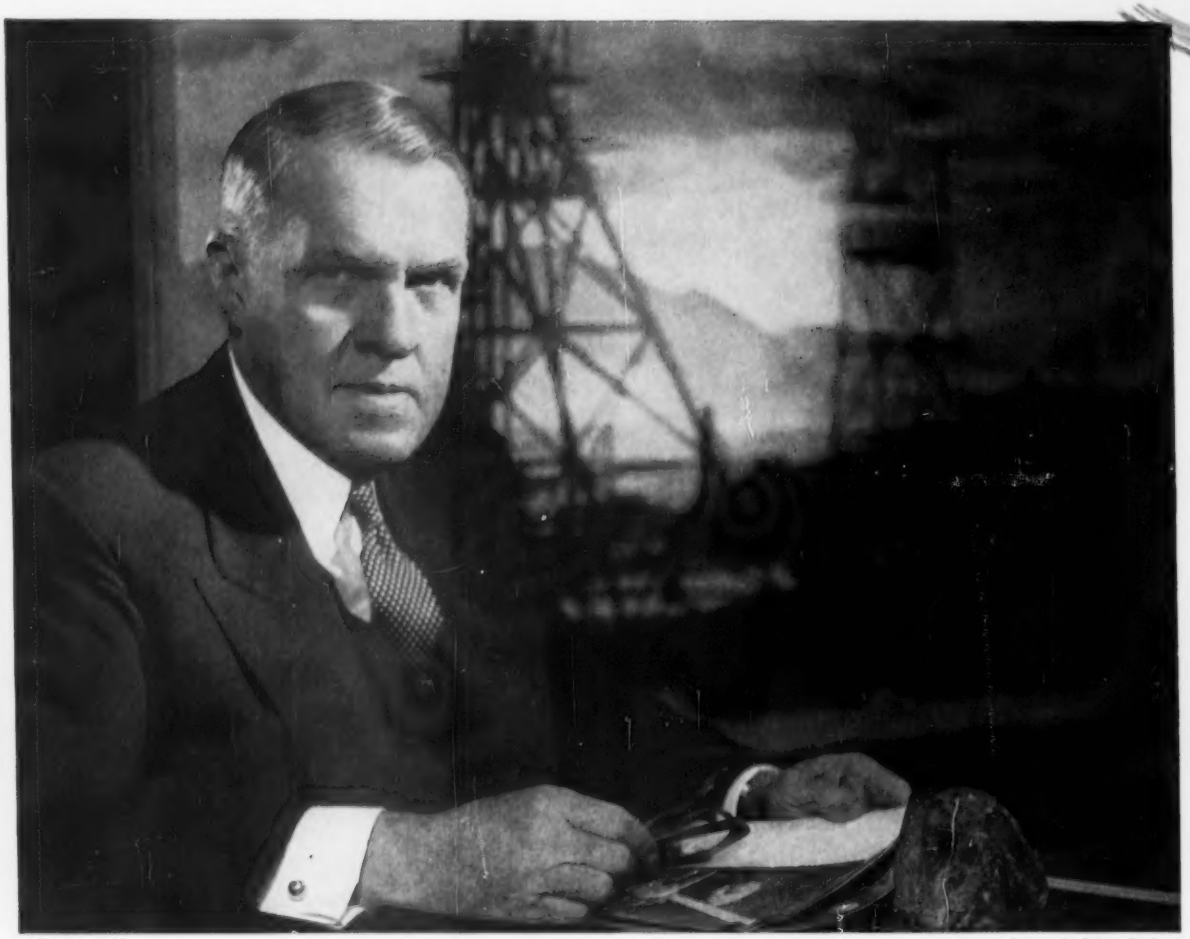
Feeding 12,400-volt sub-transmission line while stringing new conductors on transmission line.
Hours used: 145 KWH generated: 58,500



Handling daily peaks while existing transmission line and substation are being rebuilt.
Hours used: daily average 4

ELECTRO-MOTIVE DIVISION
GENERAL MOTORS
LA GRANGE, ILLINOIS

Sales Offices in Chicago, New York, St. Louis, San Francisco



CLYDE E. WEED

Portrait by Fabian Bachrach

"22,514 Anaconda Employees Are Buying U.S. Savings Bonds

"In October, 1955, only 34% (11,140) of the nearly 33,000 Anaconda organization employees in this country were buying U. S. Savings Bonds through the Payroll Savings Plan.

"Late in 1955, we conducted a simple person-to-person canvass which put a Payroll Savings Application Blank in the hands of every employee. There was no pressure, no special promotion – just the Application Blank. Our employees did the rest.

"Recently, our records showed that 22,514 of our men and women–69%–are now Payroll Savers. Every new employee is given a Payroll Savings Application Blank and an opportunity to join with his fellow workers in building personal security through systematic thrift.

"We believe The Payroll Savings Plan–with an enrollment of 8,000,000 employees of more than 40,000 companies–is a significant contribution to the Government's effort to check inflation and maintain a sound dollar."

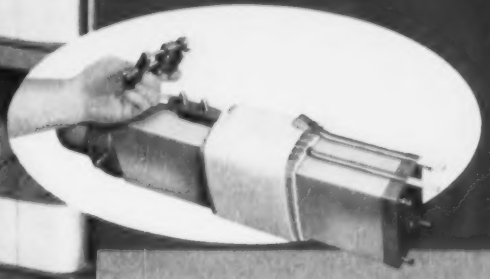
CLYDE E. WEED, *President*
The Anaconda Company

Why not take a *personal* interest in *your* Payroll Savings Plan? Your State Director will be glad to show you how to install the Payroll Savings Plan or revitalize an existing plan. Phone, wire or write, today, to Savings Bond Division, U. S. Treasury Department, Washington, D. C.

The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

ELECTRICAL WEST

She goes to a felt-padded cupboard to fetch your POLE STAR coil a mold



All Pole Star distribution transformer coils are wound on aluminum molds, which assure coil uniformity and also permit the use of special fixtures for accurate placement of leads. During winding, each low voltage lead—which is prebent to the desired radius on a jig—is held firmly in place by the two-piece clamping device shown above.

3 through 500 kva, through 67,000 volts

Accurate dimensions — particularly in the core-and-coil assembly — contribute much to the dependability and efficiency of Pole Star distribution transformers. For that reason, coils are wound on precise, aluminum molds, which are given "kid-glove" treatment when not in use. High and low voltage molds are moved directly from felt-padded storage bins to the winding machine and vice versa, with no in-between reposal on tables or floor. Frequent inspection of all molds makes certain that the original precision is maintained.

With aluminum molds, end turns are tied in with spring clips; there is no marring of the mold surface such as when nails are used for this purpose with ordinary wooden molds. A further advantage is that aluminum is not subject to "aging," whereas wooden molds often dry up and crack or shrink, with consequent changes in dimensions.

Such concern with accuracy is typical of Pole Star production methods. It means outstanding quality and dependability . . . every time.

167 Production Controls make Pole Star Best!

PENNSYLVANIA TRANSFORMER COMPANY

A McGraw Electric Company Division

CANONSBURG, PENNSYLVANIA

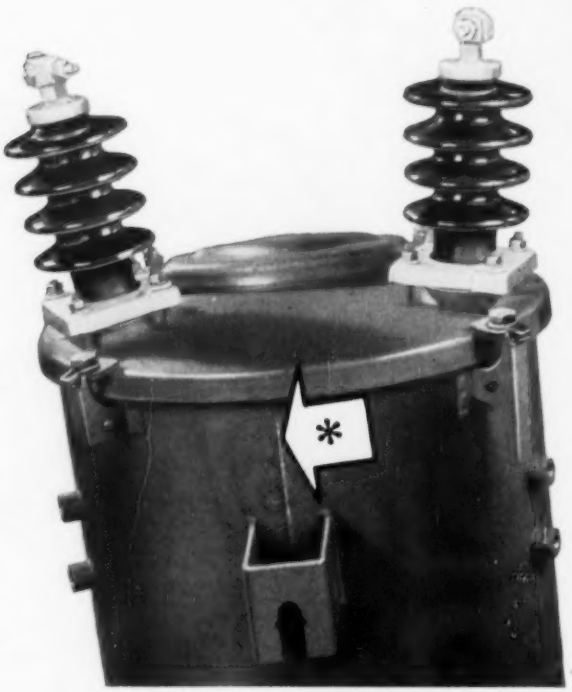
KUHLMAN "Salesman of the Week"

If you can identify this Kuhlman Electric Co. representative, and are the first one to notify Dept. SA-1, Kuhlman Electric Co., Bay City, Michigan, you will receive a valuable gift certificate. Each week a different Kuhlman representative is featured . . . watch for the Kuhlman salesman who calls on you.

"LET ME SHOW YOU WHY

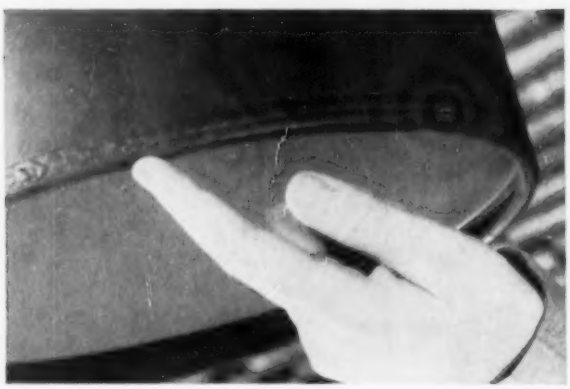
KUHLMAN TRANSFORMER TANKS ARE YOUR BEST BUY . . . . . ."

In my territory a distribution transformer tank must be leak-proof . . . air-tight . . . and rigid in construction. That's why my customers consistently order Kuhlman. They know every weld and seam of a Kuhlman tank has been factory-tested, under pressure, for oil tightness. And for all around service, they prefer Kuhlman's solid construction—moisture-proof cover fitting—and rounded tank bottom features. It will pay you to talk to your local Kuhlman representative about all the features that make Kuhlman distribution transformers your best buy.



* All welds, seams PRESSURE-TESTED

SPUN-OVER RIM—increases tank rigidity. Forms a smooth gasket seat for a moisture-proof, air-tight cover fitting.



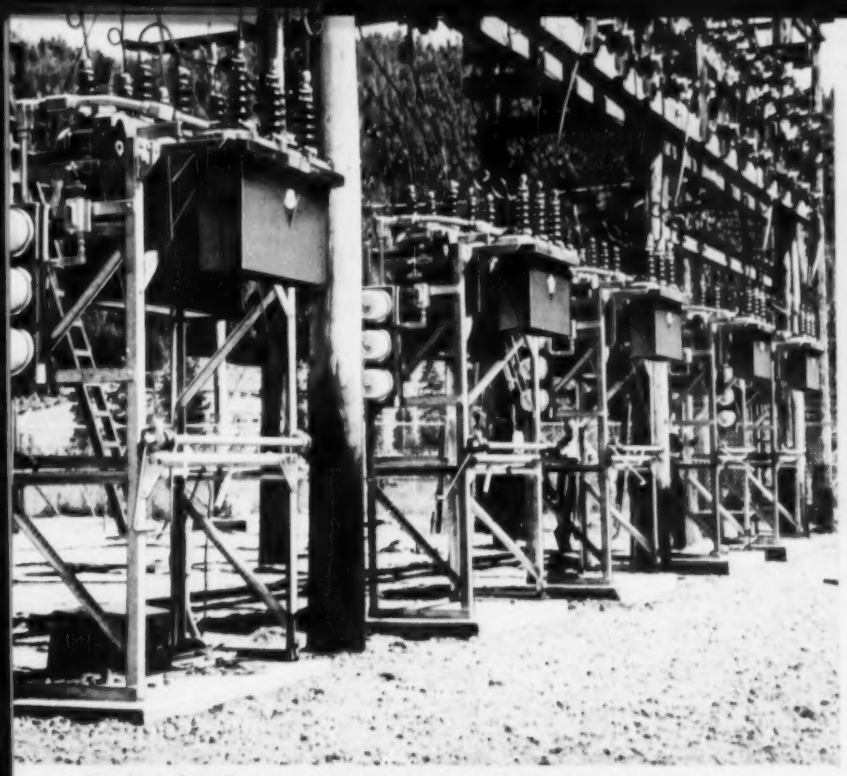
ROUNDED BOTTOM—provides added tank strength . . . sheds moisture easily . . . forms a rugged bearing surface for handling and shipping.

575b

KUHLMAN ELECTRIC COMPANY

BAY CITY, MICHIGAN • CRYSTAL SPRINGS, MISSISSIPPI • SALINAS, CALIFORNIA

Distributed By MAYDWELL & HARTZELL, INC. • SEATTLE • SPOKANE • PORTLAND • SAN FRANCISCO • LOS ANGELES • SAN DIEGO • PHOENIX



Five Kyle Type R reclosers with additional ground trip relay scheme are providing high-speed clearing on 13.8 kv distribution feeders of a 10,000 kva substation of the Washington Water Power Company, Wallace, Idaho.

Kyle Type E 23 kv reclosers have large contacts and oil cross-blast method of arc extinction. This makes it outstanding for high-voltage application.

Utilities Can Gain Greater Service Continuity and

Save Half a Million Dollars

with Kyle Reclosers

L-M Kyle reclosers offer large savings in initial investment and maintenance over circuit breakers as the feeder-disconnecting device in substations. In addition, Kyle reclosers offer large savings in the operating costs of the distribution system. These savings can amount to a half million dollars or more, as shown on the following pages.

How Operating Costs Are Cut

In addition to segregating permanent faults from the system, Kyle reclosers provide the high-speed circuit clearing required to reduce burndown for weather-proof conductors or annealing of bare conductors from transient or non-persistent faults.

With Kyle reclosers, it is possible to clear over 90 percent of total circuit faults and secure outstanding advantages such as:

Confining trouble to smaller areas.

Less serious damage to conductors and equipment.

Increased revenue because outages are reduced.

Greater service continuity.

Better public relations.

LINE MATERIAL Kyle® Reclosers

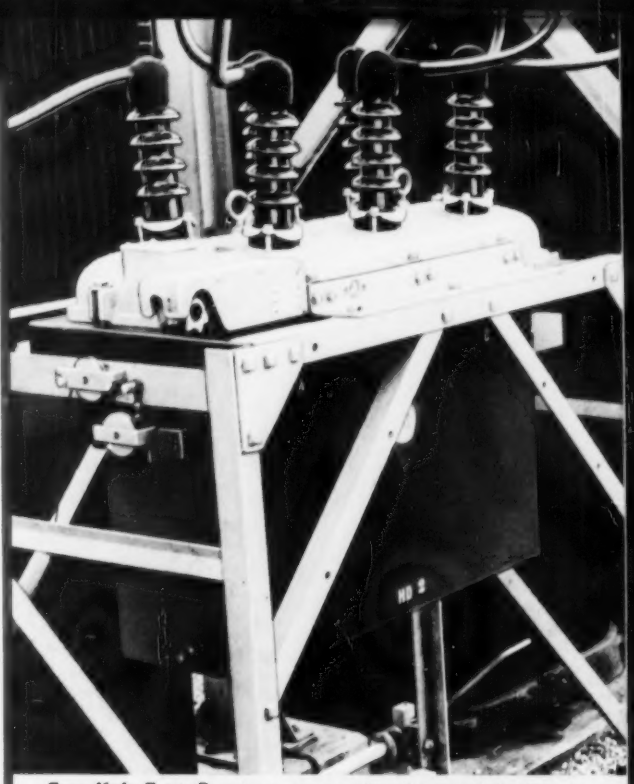
A McGRAW ELECTRIC COMPANY DIVISION

On the following pages are some facts and figures that will tell you how and why . . .

Analysis of Savings Using Kyle Reclosers for Five Years*

	Savings on 100 Substations	
I. Initial Investment Costs		
A. At substation. A Type R OCR as compared with an equivalent OCB with AC tripping and reclosing.		
1. Initial savings in equipment costs favoring each OCR—$3227.00. Total savings for 100 substations for 5 years— 2 x 5 x 100 x $3227/20	$161,350.	
2. Initial savings in labor costs to install transformers and wiring necessary to operate OCB—$30 per OCR. Total savings for 100 substations for 5 years— 2 x 5 x 100 x $30/20	1,500.	
Total initial investment savings with OCR's		$162,850.
B. On distribution feeders with 5 sectionalizing points per feeder.		
1. Equipment costs of 3 OCR's and 2 sectionalizers exceeding that of 5 fused cutouts = $491. Additional costs to utilize self-protective scheme for 200 feeders for 5 years = 5 x 200 x $491/20 (—)	$ 24,550.	
2. Labor costs of installations. OCR exceeding that of fused cutout = $15. Additional cost to utilize self-protective scheme for 200 feeders for 5 years = 5 x 200 x $15/20 (—)	750.	
Total additional costs of OCR's and sectionalizers over fused cutouts		— 25,300.
C. Net savings in initial costs with OCR's		$137,550.
II. Operating Costs (estimated 9 outages per feeder through transient conditions annually)		
A. Savings in frequency and duration of service trips resulting from transient faults 40 man-hours @ $5/hr. per feeder $200. 25 truck hours @ $1/hr. per feeder 25. Cost of fuse links per feeder 5. Total cost of transient outages per feeder $230.		
Total 5-year cost for 100 substations = 5 x 2 x 100 x $230	$230,000.	
B. Increased revenue resulting from reduced outages. 1500 KWH per outages per feeder for 5 years through loss of service @ 2¢ per KWH = 1500 x 2 x 100 x 5 x $.02	30,000.	
C. Total savings from transient fault protection for 5-year period		$260,000.
III. Maintenance Costs		
A. OCR and sectionalizer maintenance cost @ $25 per unit annually = $25 x 5 x 2 x 100 x 5 (—)	$125,000.	
B. OCB additional relay calibration costs @ $25 per unit annually = $25 x 2 x 100 x 5	25,000.	
C. Total additional costs of OCR and sectionalizer maintenance for 5 years		— $100,000.
IV. Carrying charges (conservatively estimated as 10% annually of initial capitalized investment)		
A. At substation. Savings represented by OCR's = ($3227 ÷ $30) x 2 x 100 x 5 x .10	$325,700.	
B. On line, additional cost of automatic scheme = ($15 ÷ $491) x 2 x 100 x 5 x .10 (—)	50,600.	
C. Savings in carrying charges with OCR's and sectionalizers		$275,100.
V. Subtotal		$572,650.
Additional savings resulting from Transient Fault protection		
VI. Savings realized by elimination of conductor and equipment damage through extra-fast clearing on heavy faults		$?
VII. Value of improved public relations realized through better continuity of service		$?
VIII. TOTAL SAVINGS		**Well over half a million dollars!**

**Costs are conservative estimates based on the best available information from utilities. System used to illustrate average installation consisted of 100 substations each with two 15 kv feeders, and amortized in 20 years.*



Two Kyle Type R reclosers are providing high-speed clearing of 13.8 kv feeders for transient fault protection and automatic disconnecting of permanent faults with minimum substation investment.

How Heavy-Duty Substation

The application of Kyle reclosers as the automatic disconnecting device in substations eliminates the relatively high costs of circuit breakers and associated substation equipments. This alone offers savings of a half million dollars or more in five years, based on 200 feeder positions.

Lower Initial Costs

Initial investment in Type R recloser equipment of equivalent rating will result in approximately $3,000 savings per feeder. In addition, field reports indicate that labor for installing Type R reclosers is about 50% of that for circuit breakers. The maintenance cost for reclosers is also lower than for circuit breakers.

Fewer Outages

L-M Kyle reclosers can also be justified as a fault-protective device that will reduce the number of outages caused by transient or non-persistent causes. Kyle reclosers have extremely fast opening characteristics, clearing circuit in less than 2 cycles, which minimizes conductor burndown and increases service continuity.

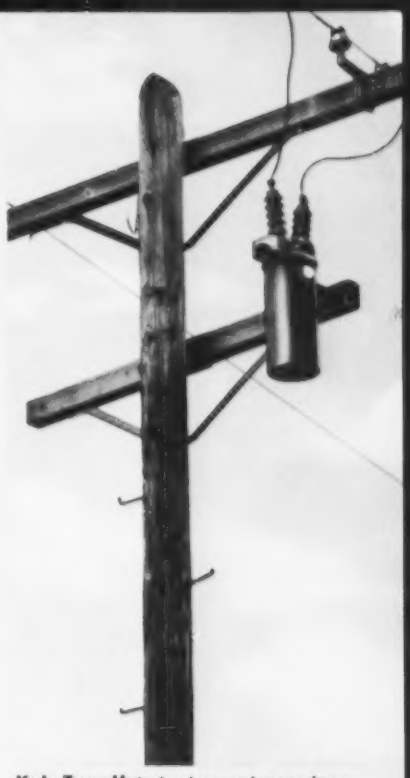
Compare the figures at the left with your construction and operating costs and see how you can save over a half million dollars with Kyle reclosers.

LINE MATERIAL

A McGRAW ELECTRIC COMPANY DIVISION

It is possible to clear over 90 percent of total circuit faults and reduce permanent faults with high-speed Kyle reclosers.

Kyle Type 3H 3-phase reclosers provide coordinated protection on rural lines with up to 1250 amperes at 14.4 kv. Where faults persist, recloser locks open on all 3 phases and confines trouble to a small area.



Kyle Type H single-phase recloser reduces the number of outages on rural lines caused by conductors whipping together on long spans, small branches grounding a conductor, or a lightning discharge.

Kyle Reclosers Reduce Investment And System Operating Costs

L-M high-speed reclosers provide better service continuity and lower operating costs by reducing conductor burndown caused by transient or non-persistent faults on the system. It is possible to clear over 90 percent of total circuit faults and reduce permanent faults with high-speed Kyle reclosers. Such faults are often caused by lightning, arrester flashover, tree limbs shorting the conductors, or conductors whipping together on long spans.

Eliminate the Shaded Area

The shaded area in the chart at right represents the additional fault-clearing ability of L-M high-speed Kyle reclosers. Kyle reclosers clear transient or non-persistent faults on the circuit with no significant damage to the system or interruption of service.

All Kyle reclosers can be coordinated in series to provide complete transient protection over entire distribution system.

Get Complete Information

Ask the L-M Field Engineer for more information on how Kyle reclosers can be profitably applied to your system. Or write Line Material Company, Milwaukee 1, Wisconsin. In Canada: Canadian Line Materials, Ltd., Toronto 13, Ontario.

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Kyle® Reclosers

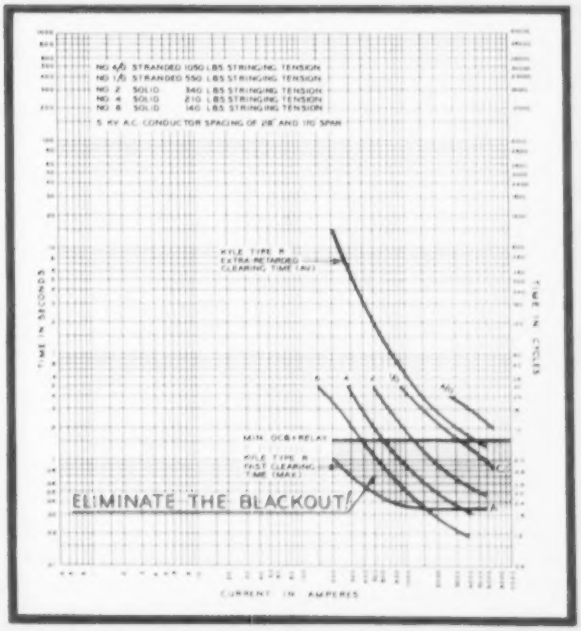
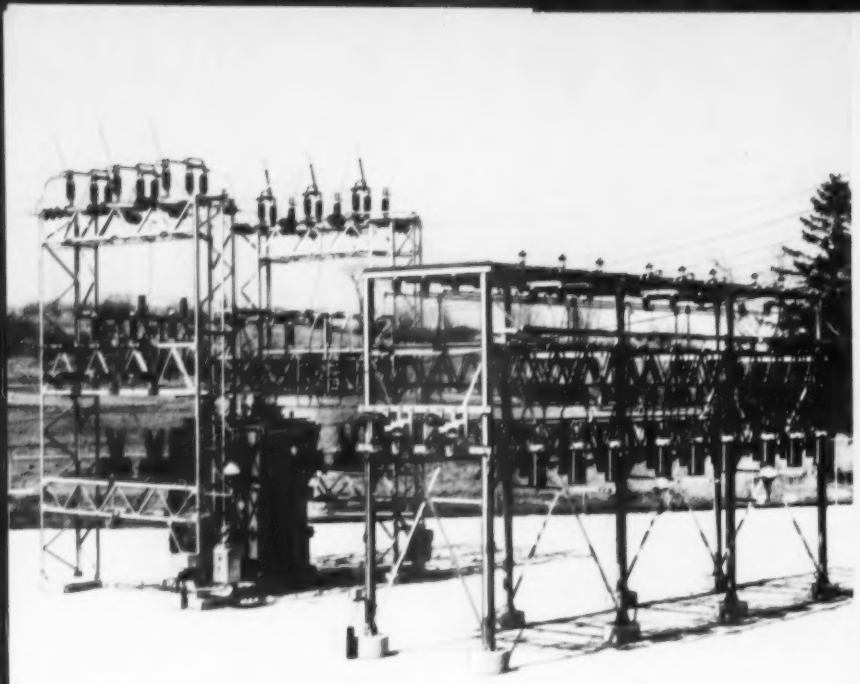
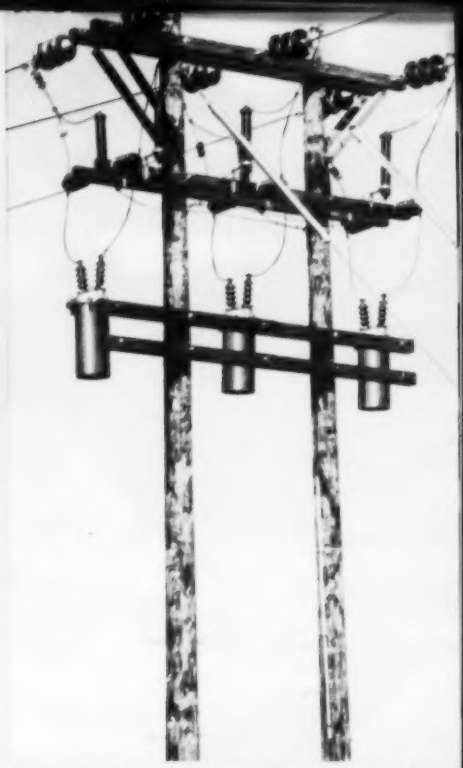

NO 4/0 STRANDED 1050 LBS STRINGING TENSION
NO 1/0 STRANDED 550 LBS STRINGING TENSION
NO 2 SOLID 340 LBS STRINGING TENSION
NO 4 SOLID 210 LBS STRINGING TENSION
NO 6 SOLID 140 LBS STRINGING TENSION
5 KV A.C. CONDUCTOR SPACING OF 28" AND 170 SPAN
KYLE TYPE K EXTRA RETARDED CLEARING TIME (MAX.)
MIN. OCB & RELAY
KYLE TYPE K FAST CLEARING TIME (MAX.)
ELIMINATE THE BLACKOUT!
TIME IN SECONDS
CYCLES
CURRENT IN AMPERES

Chart shows primary line burndown characteristics for weatherproof wire. It also gives the maximum clearing time for high-speed Kyle reclosers and minimum clearing time for the average circuit breaker plus relay time. The shaded area represents the additional protection that can be obtained with Kyle reclosers in place of circuit breakers.

more ▶



Nine Kyle Type L heavy-duty, single-phase reclosers are providing high-speed clearing of transient faults and automatic disconnecting of permanent faults with minimum substation investment.



Kyle Type E 23 kv reclosers have large contacts and oil cross-blast method of arc extinction. This makes it outstanding for high-voltage application.

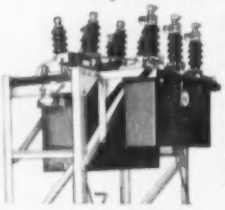
Coordinated Automatic Protection from Substation to Customer's Service

Only Line Material offers a fully coordinated series of single-phase and 3-phase reclosers that will provide complete transient fault protection from substation to load.

Heavy-Duty Type R Recloser

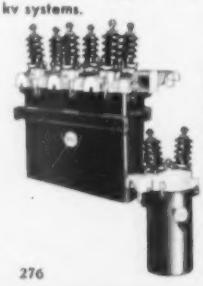
L-M Kyle reclosers are completely self-contained, fully automatic fault-protective devices designed to replace breakers in substations with up to 100,000 kva fault capacity. L-M's heavy-duty Type R 3-phase recloser provides simultaneous tripping of all three phases, with reclosing and dual timing to permit coordination with fuses. This recloser also offers facilities to adapt almost any auxiliary relays and indicating equipment to supplement the normal series overcurrent tripping of the recloser.

Complete Line of Equipment



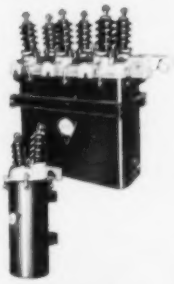
Kyle Type R heavy-duty 3-phase reclosers are available from 25 to 400 amperes, with symmetric interrupting ratings up to 6000 amperes at 4.8 kv and below, and 4000 amperes up to 14.4 kv.

Kyle Type E intermediate-duty single-phase reclosers are available in normal load ratings from 5 to 100 amperes, interrupting ratings up to 1750 symmetric amperes, for applications on 23 kv systems.



Kyle Type H and 3H single-phase and 3-phase reclosers respectively, are available in normal load ratings 5 to 50 amperes, interrupting ratings up to 1250 symmetric amperes, for rural applications on 2.4 to 14.4 kv systems.

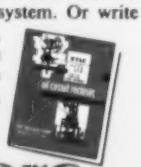
Kyle Type L heavy-duty single-phase reclosers are available in normal load ratings from 25 to 280 amperes, interrupting ratings up to 6000 symmetric amperes at 4.8 kv and below and 4000 amperes up to 14.4 kv for substation application, or out on the line.



Kyle Type 4H and 6H intermediate-duty single-phase and 3-phase reclosers respectively, are available in normal load ratings from 5 to 100 amperes interrupting ratings up to 3000 symmetric amperes, 110 kv BIL, for urban applications on 2.4 to 14.4 kv systems.

Get Complete Information

Ask the L-M Field Engineer for more information on how Kyle reclosers can be profitably applied to your system. Or write Line Material Company, Milwaukee 1, Wisconsin. In Canada: Canadian Line Materials, Ltd., Toronto 13, Ontario.



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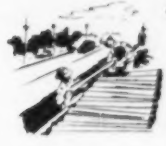
LINE MATERIAL **Kyle® Reclosers**

A McGRAW ELECTRIC COMPANY DIVISION

An 8-tier run of Soapstone OCT-O-DUCT provides a new telephone link down hard-rock Nob Hill to colorful Chinatown in San Francisco.

YOU CAN ACTUALLY SEE SOAPSTONE DUCT SAVE YOU MONEY

1 Trenchside delivery of Soapstone OCT-O-DUCT eliminates field inventory problems and makes certain your duct is at your job when you need it.



2 OCT-O-DUCT's convenient 4-foot lengths can be quickly installed by 2-men crews even in narrow and deep trenches.

3 OCT-O-DUCT's exclusive, flat-sided design eliminates the need for expensive interlayer spacers. Duct will not roll.

4 OCT-O-DUCT is connected in the trench with easy-to-apply circular couplings making possible fast, rhythmic, production-line installation.

The many time- and work-saving features of Soapstone OCT-O-DUCT and full information on the sizes, bends and accessories available from this 30-year-old Company are contained in our Catalog and Installation Manual. For your FREE copies, drop us a note on your letterhead.

SOAPSTONE DUCT COMPANY

3985 Beach Street, Oakland 8, California

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MAYDWELL & HARTZELL, INC.

SAN FRANCISCO, LOS ANGELES, SAN DIEGO,
PHOENIX, PORTLAND, SEATTLE, SPOKANE

New space-miser network transformer now 12″ shorter, 20% lighter, occupies 15% less space

Slashing maintenance a dozen ways is the story of the new Westinghouse 500-kva subway transformer. Easier servicing and even better electrical performance place this product in a class by itself.

1. Protection against partial vault flooding—with a 12″ reduction in height, transformers can now be off the floor, set on I beams.

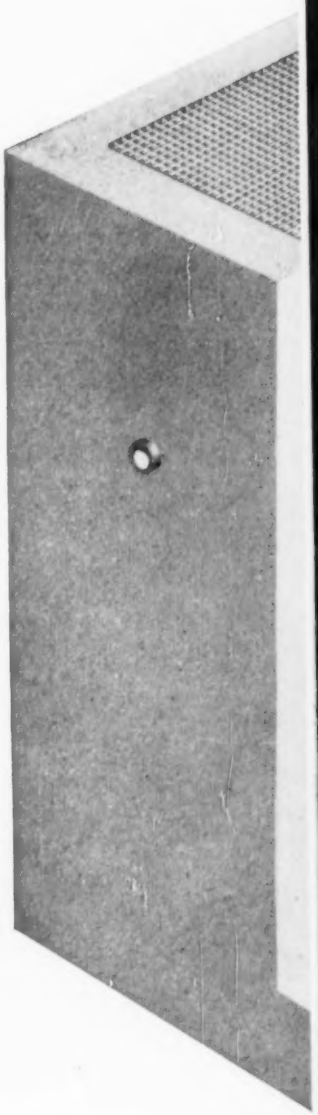
2. Installation easier, handling safer—new transformer is 20% lighter.

3. Contoured . . . round corners replace sharp edges on new diving bell tank.

4. Easier to wash down and paint, virtually self-cleaning—new contour design of Yukon Coolers eliminates 68 former sources of corrosion.

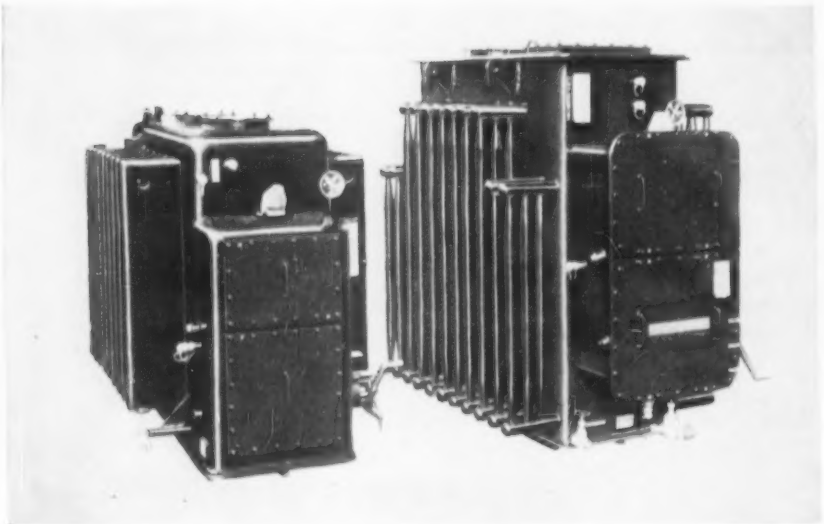
5. More accessible high-voltage terminal chamber—exclusive integral tank design lowers switch compartment; switch and core-coil assembly now housed in one smooth, unwelded exterior on a common base plate.

For network transformers that set the standard, talk to your Westinghouse sales engineer, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-70781

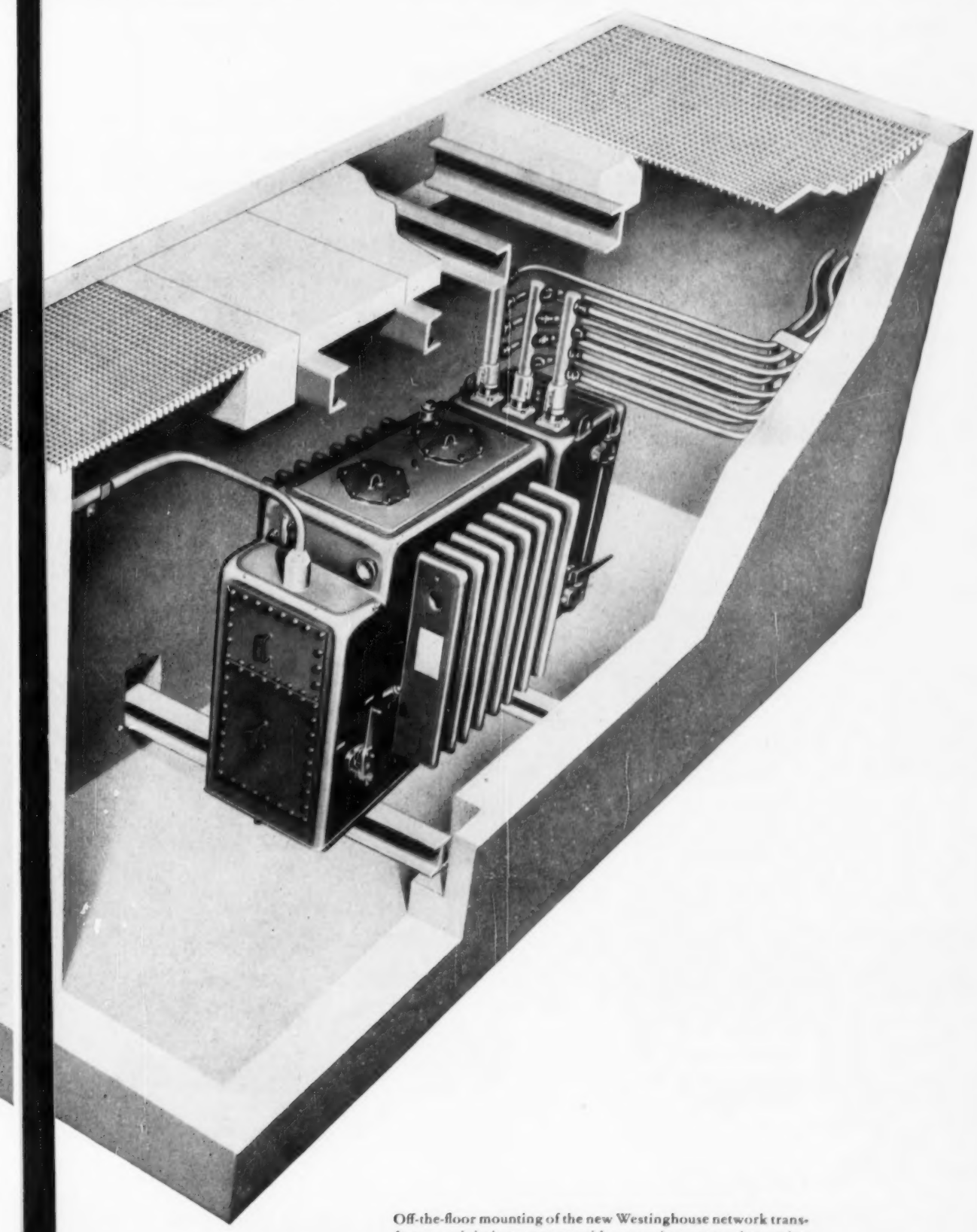


WATCH WESTINGHOUSE!

*WHERE **BIG** THINGS ARE HAPPENING FOR **YOU**!*

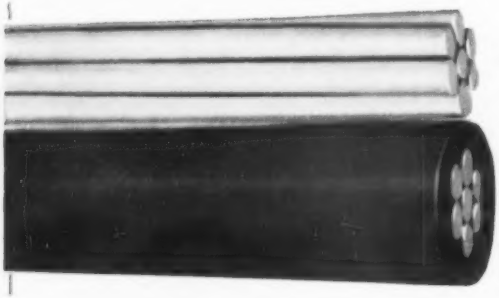


(*Right*) Previous 500-kva network subway transformer. (*Left*) New Westinghouse design features exclusive Yukon Coolers, greater spacing, more clearance to floor—refinishing is no problem.

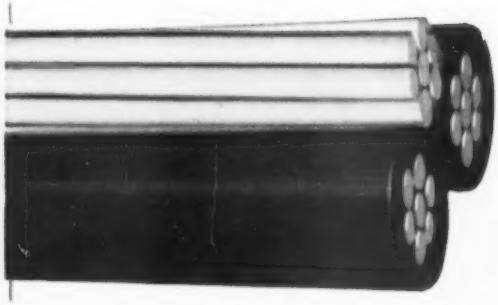


Off-the-floor mounting of the new Westinghouse network transformer minimizes contact with corrosive matter; inspection and maintainance are quicker, easier.

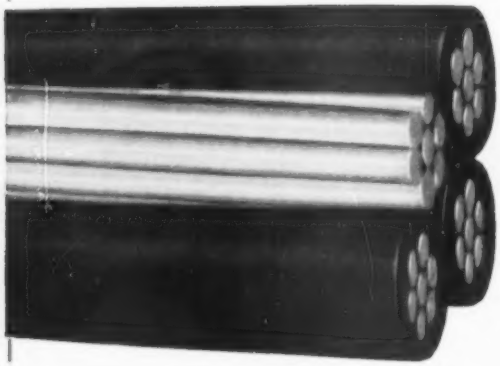
WEATHERPROOF



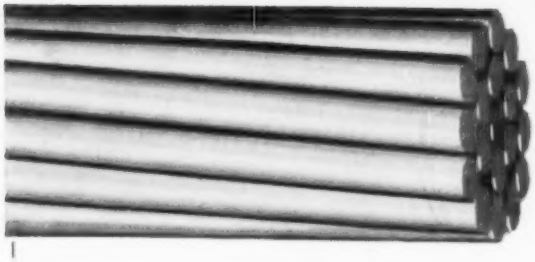
DUPLEX



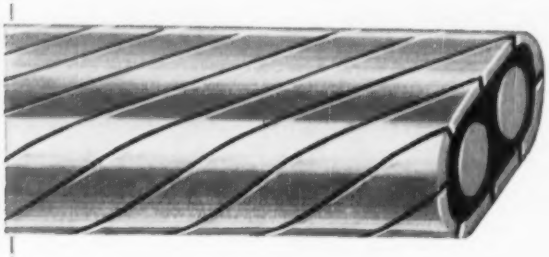
TRIPLEX



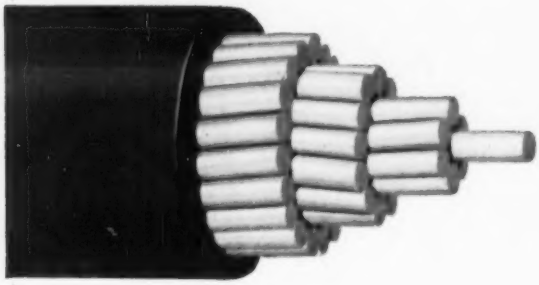
QUADRUPLEX



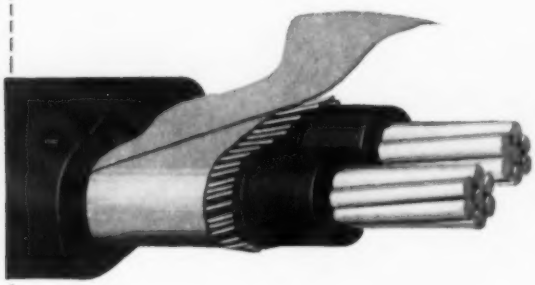
ASCR · ALL-ALUMINUM · AAAC



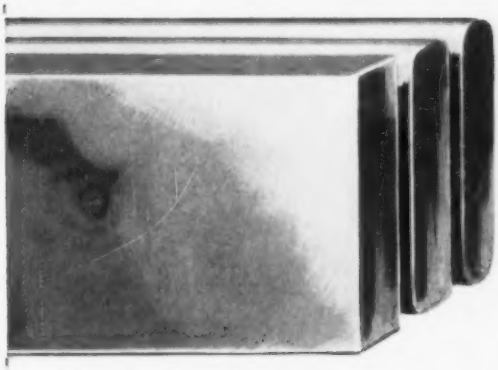
ARMORED SERVICE DROP



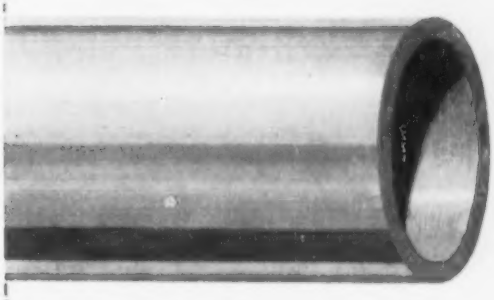
BUILDING WIRE



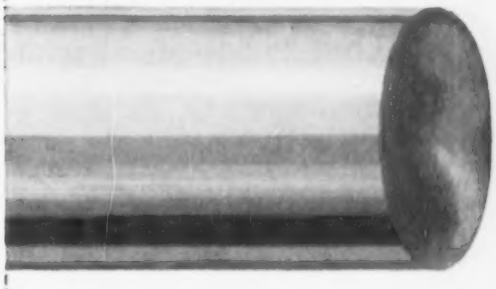
SERVICE ENTRANCE CABLE



RECTANGULAR BUS CONDUCTOR



TUBULAR BUS CONDUCTOR



SOLID BUS CONDUCTOR

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your KW distributor carries it!

YOUR KW DISTRIBUTOR carries a *wide range* of the KW products shown here. So why not take full advantage of this convenient local source of supply? Make it a habit to call your KW distributor *first.* (Refer to the list shown and see your local telephone directory.)

Kaiser Aluminum & Chemical Sales, Inc., *Executive Office,* Kaiser Bldg., Oakland 12, California; *General Sales Office,* Palmolive Bldg., Chicago 11, Illinois.

See "THE KAISER ALUMINUM HOUR," Alternate Tuesdays, NBC Network. Consult your local TV listing.

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Eoff Electric Co.
Evans Electrical Supply Co.
Fairmont Supply Co.
Florida Electric Supply, Inc.
Gem City Electric Co.
General Electric Supply Co.
Heider Electric Supply
H. E. P. Supply Co.
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"CORDON" CIRCUIT BREAKERS

Widely accepted for high fault protection on low voltage applications

. . . 4 frame sizes available for immediate delivery

Conceived and engineered at I-T-E. Recognizing the need for a practical and economical means to adequately protect low-voltage distribution circuits where very high fault currents are encountered, I-T-E engineers conceived and developed the first completely integrated current-limiting molded case circuit breaker. Named the "Cordon", this compact circuit breaker has an interrupting rating of 100,000 rms amperes.

Manufactured and tested by I-T-E. The "Cordon" combines all the design and operating advantages of standard I-T-E molded case circuit breakers with the proven high interrupting ability of current limiting Amp-Traps.* A prototype of this was developed, tested and re-tested until it met the rigid I-T-E standards. Then, and only then, was a complete line offered to industry. Four frame sizes are now available.

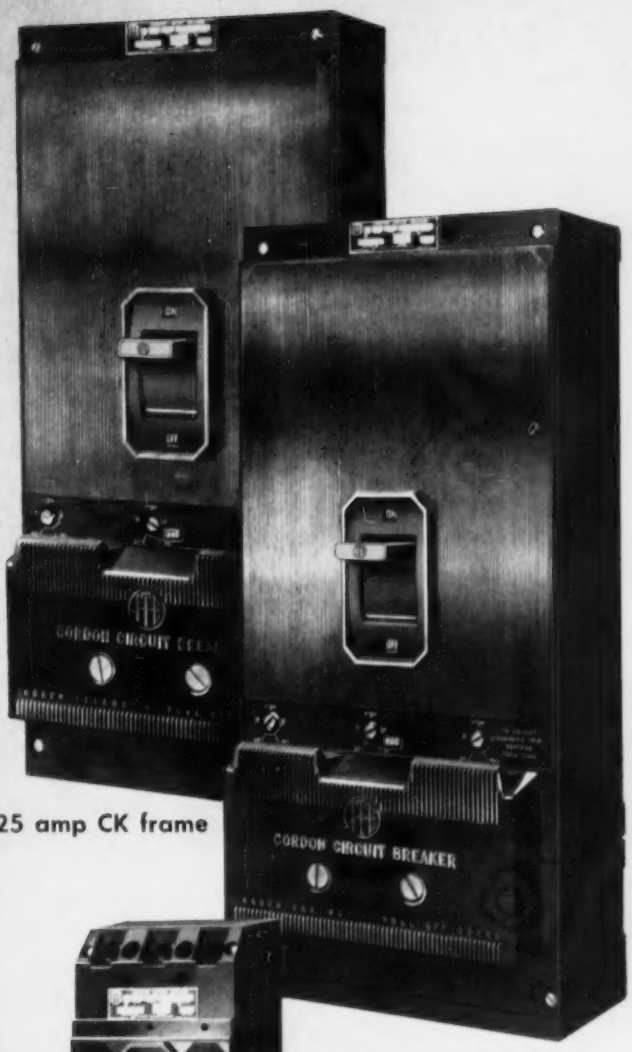
*Amp-Trap: T.M. Reg. The Chase-Shawmut Co.

Widespread acceptance. Now thousands of delivered "Cordon" circuit breakers prove industries' acceptance of this device and confirm I-T-E's belief in the need for it. More and more "Cordon" circuit breakers are being specified as the practical, economical answer for low voltage, high fault applications.

Learn more about this new concept in circuit protection. Contact the I-T-E sales office nearest you, or write for Bulletin 5042A.

I-T-E CIRCUIT BREAKER COMPANY • Small Air Circuit Breaker Division

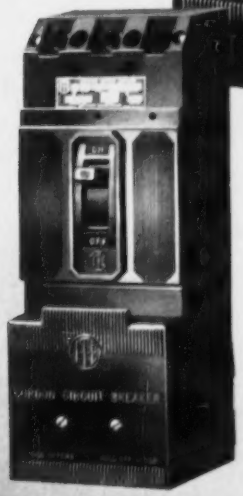
19th & Hamilton Sts., Philadelphia 30, Pa.



225 amp CK frame

400 amp CKL frame

600 amp CL frame



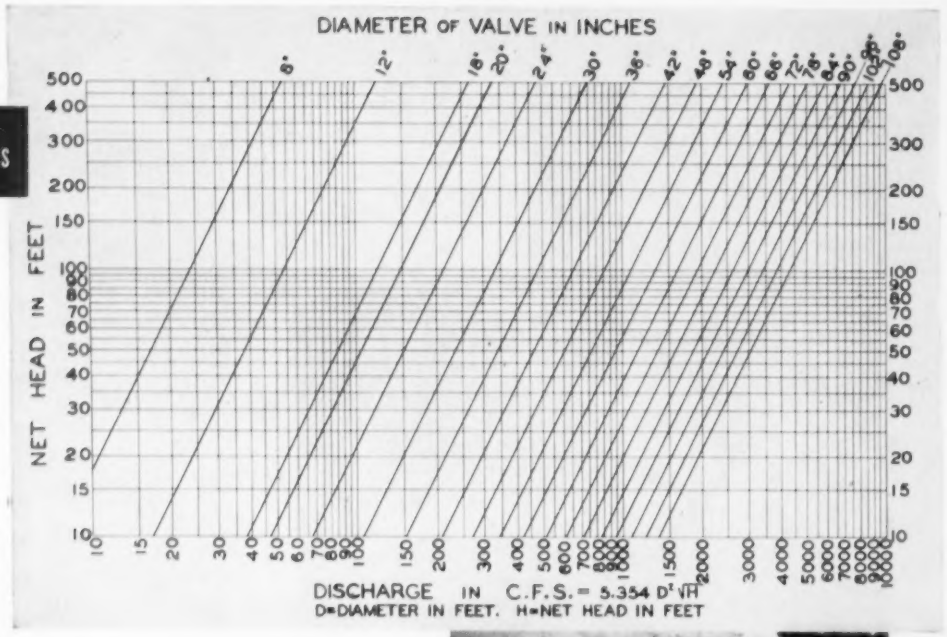
100 amp CF frame

Engineers are now specifying these I-T-E Current-Limiting "Cordon" Circuit Breakers.

Immediate delivery can be made on all four frame sizes, for 600 v a-c and 250 v d-c service, 15 to 600 amperes.

I-T-E

SMS
HOWELL-BUNGER VALVES



EASY REGULATION OF FREE DISCHARGE THROUGH HIGH TO LOW HEAD RANGE

SMS Howell-Bunger Valves provide easy regulation and control of water under free discharge. Tremendous amounts of energy can be dissipated with a minimum of erosion, cavitation and no vibration. Because of this valve's high discharge coefficient, pipe line or conduit size can be held to a minimum for economical construction.

The extremely rugged and simple design of the SMS Howell-Bunger Valve provides these essential features:

- Free discharge with safe energy dissipation
- Hydraulic balance without vibration
- High coefficient of discharge for an energy dissipating valve
- Minimum cavitation and maintenance
- Simplicity of operation
- Only one moving part in contact with stream flow
- Low initial cost
- Discharges into atmosphere or submerged.

S. Morgan Smith Company offers you more than 75 years experience with hydraulic equipment. The SMS name plate is your assurance that performance will equal or exceed specifications. For full information on Howell-Bunger Valves, turbines and related hydraulic equipment write the S. Morgan Smith Company, York, Pennsylvania.

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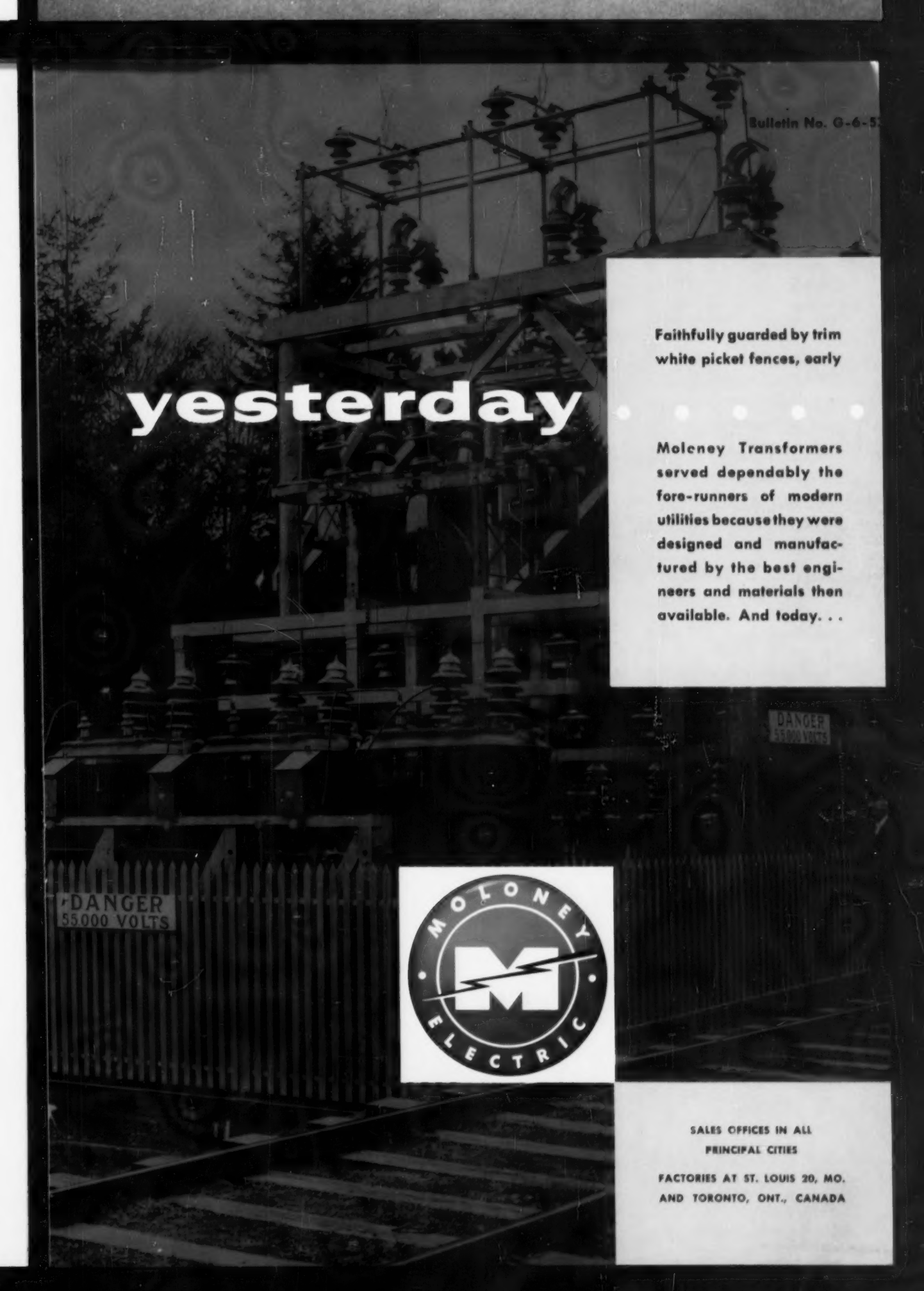
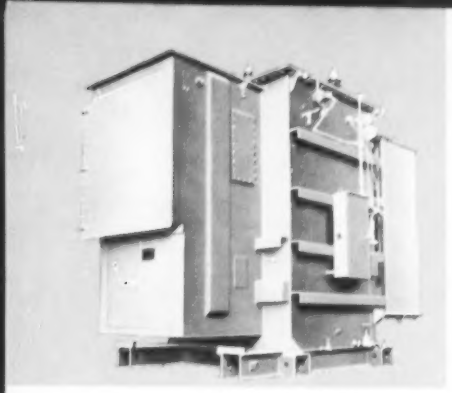
AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED, TORONTO

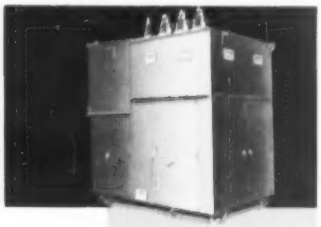

Bulletin No. G-6-5
yesterday
Faithfully guarded by trim white picket fences, early
Moloney Transformers served dependably the fore-runners of modern utilities because they were designed and manufactured by the best engineers and materials then available. And today. . .
DANGER
55,000 VOLTS
MOLONEY
M
ELECTRIC
SALES OFFICES IN ALL PRINCIPAL CITIES
FACTORIES AT ST. LOUIS 20, MO. AND TORONTO, ONT., CANADA

today . . .

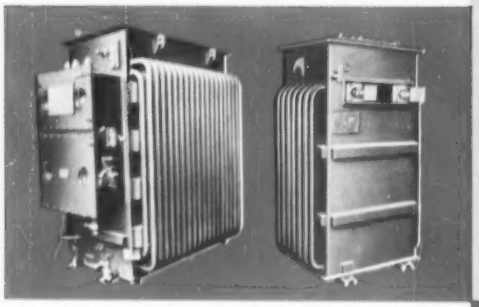


REGULATING TRANSFORMERS AND
FEEDER VOLTAGE REGULATORS

INTEGRAL PRIMARY UNIT SUBSTATIONS

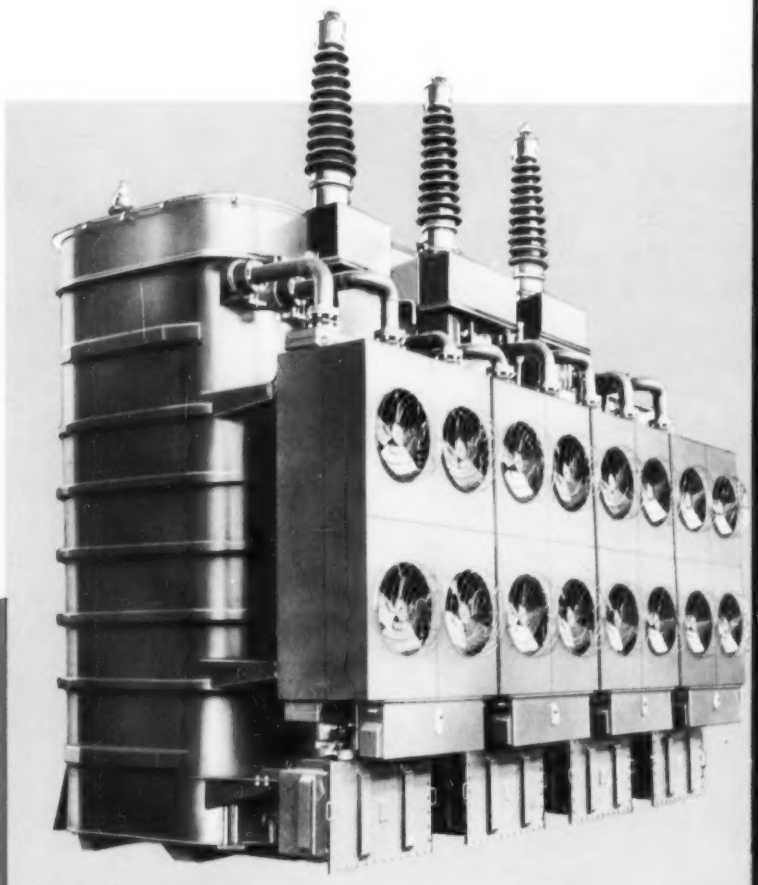


ASKAREL LOAD
CENTER TRANSFORMERS



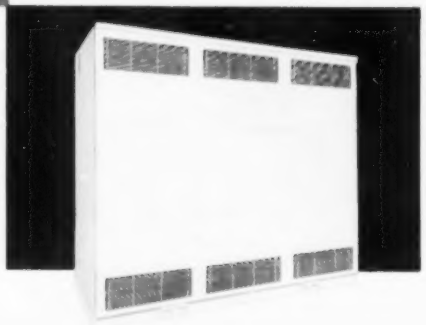
NETWORK TRANSFORMERS

SUBWAY TRANSFORMERS

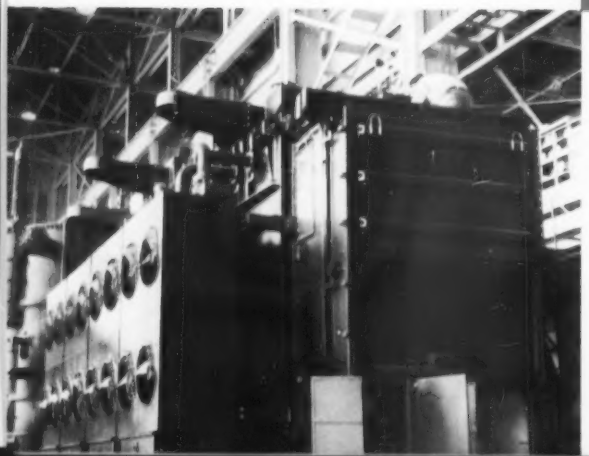


POWER TRANSFORMERS

NITROGEN-SEALED DRY-TYPE
TRANSFORMERS

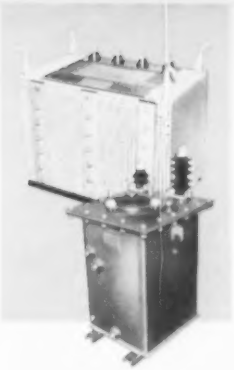


VENTILATED DRY-TYPE
LOAD CENTER
TRANSFORMERS



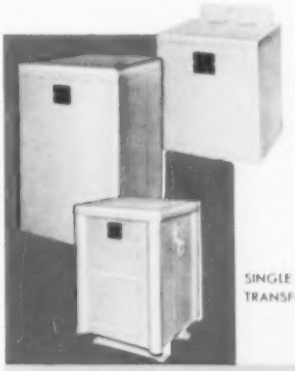
LOAD TAP CHANGING
TRANSFORMERS

Contemporary Moloney Transformers, echoing Moloney's vast experience, serve you dependably today because they're the result of the intelligent application of creative engineering.



TRANSFORMERS AND INDUCTORS FOR ELECTRONICS

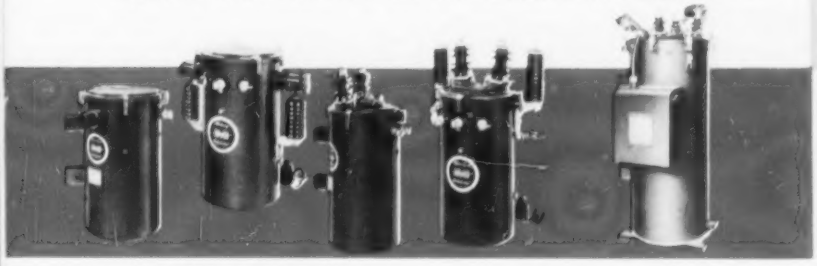
POWER TRANSFORMERS available in any Kva and voltage rating in both standard and special designs for utility and industrial application. **REGULATING TRANSFORMERS AND FEEDER VOLTAGE REGULATORS** utilize Moloney Load Tap Changing Equipment to provide constant line voltage for all transmission and feeder lines. Available in all standard and special Kva and voltage ratings. **INTEGRAL PRIMARY UNIT SUBSTATIONS** incorporate primary disconnect and secondary circuit breakers with Power Transformer and Automatic Load Tap Changing Equipment in single package for outdoor installations. **NITROGEN-SEALED DRY-TYPE TRANSFORMERS,** (Group 3 Insulation) offer ultimate in protection against fire, explosion and atmospheric contamination. Install at the job, either indoors or outdoors, without expensive vaults. Meets insurance requirements. Available in Kva and voltage ratings that meet your specifications. **NETWORK TRANSFORMERS,** designed to operate under unusual and strenuous conditions, easily handle overloads. Available in either EEI-NEMA standard or special ratings. **SUBWAY TRANSFORMERS** for installation where protection against submersion is required. Available in standard and special ratings. **ASKAREL LOAD CENTER TRANSFORMERS** permit indoor installation without fire hazard. Available in Kva and voltage ratings to meet your specifications. **LOAD TAP CHANGING TRANSFORMERS** combine Moloney Power Transformers and Automatic Load Tap Changing Equipment. Moloney versatile Load Tap Changers are available for standard and special design power transformers, also for special applications. **VENTILATED DRY-TYPE LOAD CENTER TRANSFORMERS,** (Group 2 Insulation) installed indoors, permit efficiency and economy in location. Available in all Kva and voltage ratings to meet your specifications. **TRANSFORMERS AND INDUCTORS FOR ELECTRONICS** meet size and weight limitations without compromising performance characteristics. Available in all sizes and voltage ratings. **SINGLE PHASE DRY-TYPE TRANSFORMERS**—A. TYPE DWH DRY-TYPE TRANSFORMERS. 1½ through 15 Kva, 600 volts and below. B. TYPE DWH DRY-TYPE TRANSFORMERS. 25 through 50 Kva, 600 volts and below. C. TYPE DVB DRY-TYPE TRANSFORMERS. 25 through 50 Kva, 600 volts and below. **CONSTANT CURRENT TRANSFORMERS** maintain rated lamp current on street lighting circuits under all conditions of load. Available in standard and special ratings, in both Conventional and Packaged Unit Types. **LARGE DISTRIBUTION TRANSFORMERS** for secondary substation application. Available in all standard Kva and voltage ratings. **HyperCore CONVENTIONAL AND CSP DISTRIBUTION TRANSFORMERS** available



SINGLE PHASE DRY-TYPE TRANSFORMERS

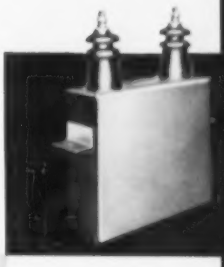
CONSTANT CURRENT TRANSFORMERS

LARGE DISTRIBUTION TRANSFORMERS



HYPERCORE CONVENTIONAL AND CSP DISTRIBUTION TRANSFORMERS

SINGLE PHASE POLE-TYPE FEEDER VOLTAGE REGULATORS

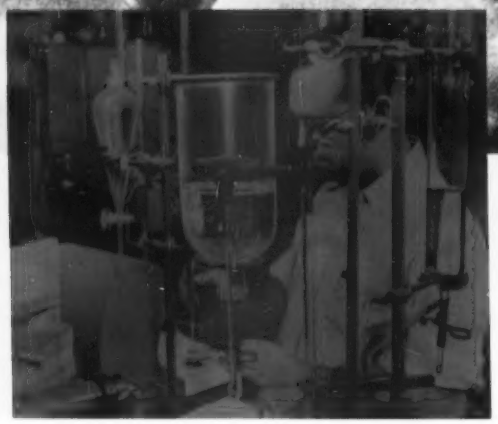


CAPACITORS

in all standard ratings. **SINGLE PHASE POLE-TYPE FEEDER VOLTAGE REGULATORS** eliminate secondary feeder regulation problems due to suburban growth and overloaded lines by providing positive, constant voltage under varying load conditions without service interruptions. Plus or minus 10% voltage regulation provided in 32-⅝% steps. Automatic control equipment can be mounted directly on the tank or at the base of the pole. **HyperCores** for electronic transformers and inductors are smaller, lighter, and have low loss characteristics. **CAPACITORS** available in standard Kvar ratings for primary voltage power factor correction.

HYPERCORES FOR ELECTRONIC TRANSFORMERS AND INDUCTORS

MOLONEY ELECTRIC COMPANY



Tomorrow's transformers depend upon today's research. Constant research and development on new materials, new design concepts, and changing needs, assure you of the continued high quality of Moloney Electric Company's Transformers for tomorrow and the day after. The time lag between "ivory tower" ideas and industrial application in high quality products is being shortened by intensive research and development in materials and concepts at the Moloney Electric Company's Research and Development Laboratory, and throughout the manufacturing facilities of the plant.

MOLONEY ELECTRIC

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MOLONEY ELECTRIC COMPANY

Power Transformers • Distribution Transformers • Load Tap Changing Transformers • Regulating Transformers • Step Voltage Regulators • Primary Unit Substations • Secondary Unit Substation Transformers • Network Transformers • Series Street Lighting Transformers • Subway Transformers • Industrial Dry Type Transformers • Capacitors • Transformers and Inductors For Electronics

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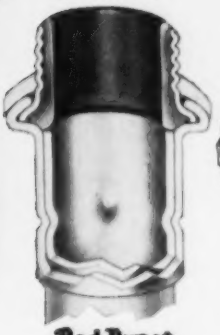
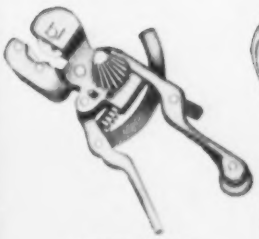
Red Throat
Insulated Connector



Red Throat
Cross section



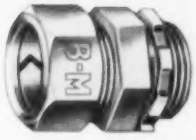
"BM" #100
Cutter for ½, ¾ and 1" E.M.T.

"BM" #1000
Holder for ½, ¾ and 1" E.M.T.

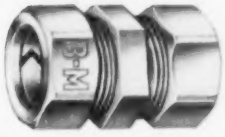
"BM" #607
½" Indenter

"BM" #600
Changeable Jaw Indenter

Briegel Rain-Tight E.M.T. Compression Fittings



SIZES FROM
½" to 2"



SIZES FROM
½" to 2"

SIZES
½", ¾", 1"

SIZES
½", ¾", 1", 1¼"

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BRIEGEL METHOD TOOL CO.

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Standard-threaded rigid steel conduit is the only wiring system approved today by the National Electrical Code as moisture-, vapor-, dust- and explosion-proof for use in hazardous locations and occupancies.

Permanently safe wiring systems today demand the use of Youngstown Buckeye full-weight rigid steel conduit for positive protection from damaging elements such as water, moisture, vapor, dust and dirt. It's been the accepted standard of architects, contractors and owners who have found over the years its higher quality and longer service life spell increased profits and less trouble on-the-job.

Users across the nation consistently report Buckeye Conduit is easy to fabricate—easy to fish wires through—and guarantees trouble-free installations because of its excellent corrosion resistance.

Leading distributors in every industrial and electrical market are ready to serve you quickly from their ample stocks. They're as near as your phone—why not call now?

Ask your distributor for Youngstown Buckeye Full Weight Rigid Steel Conduit and Youngstown Electrical Metallic Tubing.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

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Now! At Load Bonus Settings,
General Electric's new ML-32
Voltage Regulator . . .

IGNORES SHORT CIRCUITS

By D. D. MacCarthy, Manager—
Feeder Voltage Regulator Engineering,
General Electric Company.

With the advent of Load Bonus, which G.E. introduced last year, some utilities asked what effect short circuits would have on regulators operating on higher current settings. Now we can give this quick and categorical answer:

General Electric ML-32 step regulators will withstand short-circuit currents up to 25 times the increased current at each Load Bonus setting for the time durations tabulated below.

Load Bonus, of course, means that, at ±5% regulation, G-E ML-32 single-phase step voltage regulators are suitable for currents up to 160% of rating, to a maximum of 400 amperes.

Now, the ML-32's extra short-circuit strength allows you to take full economic advantage of the 60% Load Bonus feature in applications where previously short-circuit capacity has been a limitation. Check the chart below. You will note that, in all cases, the ML-32 regulator will withstand short circuits long enough for circuit-interrupting devices to go into action.

For more information on the ML-32, write Section 423-16, General Electric Co., Schenectady 5, N. Y. or contact your General Electric sales office or agent.

Add load, maintain short-circuit capacity:

Regulating Range (Percent)	Load Bonus Current* (% of basic rated current)	Short-circuit Capacity** (% of basic rated current)	Short-circuit Duration (Seconds)
±10	100%	100% x 25	2.0
± 8¾	110%	110% x 25	1.6
± 7½	120%	120% x 25	1.4
± 6¼	135%	135% x 25	1.1
± 5	160%	160% x 25	0.8

*400 amperes maximum
**10,000 amperes maximum

ML-32 step regulators will withstand short-circuit currents up to 25 times the increased current at each Load Bonus setting for the time durations tabulated at left.

Progress Is Our Most Important Product

GENERAL ELECTRIC

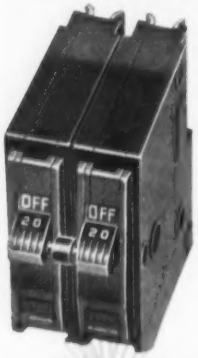
Something NEW Has Been Added To—

QO—FINEST BREAKER EVER BUILT!

1-POLE

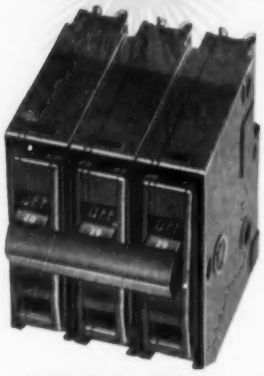
15-50 Amps

2-POLE



15-70 Amps

3-POLE



15-50 Amps

ONE, TWO and THREE POLES GO ANYWHERE—UNLIMITED!

Square D's NEW 3-pole QO crashes the 3-phase price barrier!

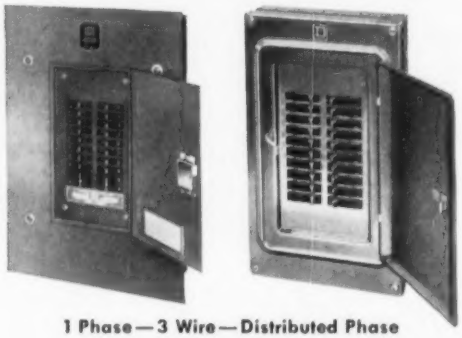
Square D's 2-pole QO Now extended to 70 Amperes for heavier loads!

QO FEATURES

- One size per pole. No space penalty
- Plug-in mounting. No time-wasting screws
- Silver-plated connections equal to best bolted design
- Switches like a "T" rated switch
- Temperature-corrected. No nuisance tripping
- Meets Federal Spec WP-131A—Class A
- Box lugs on line, load and neutral
- Rejection "ears" prevent overprotecting mistakes
- **NO CALL BACKS**

Write for QO Bulletin. *Address Square D Company,*
4335 Valley Boulevard, Los Angeles 32, California

SAME BREAKER...PANELBOARDS & LOADCENTERS



1 Phase—3 Wire—Distributed Phase
3 Phase—4 Wire—Distributed Phase
2 THROUGH 42 CIRCUITS

NOW...EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE!

SQUARE D COMPANY

THE BEST COSTS LESS INSTALLED

EXCLUSIVE "INCH-MARK"® makes quick measurement a cinch. Every length of Republic ELECTRUNITE® E.M.T. is like a 10-foot rule—marked off from end to end in *feet* and *inches*. You avoid the clumsy problem of a flat rule on a round tube . . . eliminate guesswork. To cut tubing, a 32-tooth hacksaw blade is recommended.

EXCLUSIVE "GUIDE-LINE" extends full length of tubing. By properly aligning with calibrations on Republic Bender, bends are kept in the correct plane, thus avoiding costly "wows". Get perfect saddles, offsets and back-to-back bends. Both "Inch-Marked" and "Guide-Lined" features come in ½", ¾", 1" and 1¼" sizes.

EXCLUSIVE "INSIDE-KNURLING" reduces friction, thanks to inside ball-bearing surface—makes wire pulling as much as 30% easier. ELECTRUNITE E.M.T. is made to Underwriters' Laboratories Standards—is approved by the National Electrical Code for concealed, open and concrete construction.

UNIFORM DUCTILITY in every foot of Republic ELECTRUNITE E.M.T. assures smooth, accurate bends *every time*—with no costly kinks. Welded by the famous Electrunite Process, this quality conduit is 100% Republic—from ore to finished product. And rigid manufacturing-controls assure *complete* uniformity.

GALVANIZING protects every inch of Republic ELECTRUNITE E.M.T. The special galvanized finish will not chip or flake when tube is bent. And because ELECTRUNITE E.M.T. is threadless, there's no unprotected steel exposed at the joint, no wrench marks to damage the smooth finish.

UNIFORM CONCENTRICITY provides a truly round tube for snug-fitting connections that completely shut out moisture and concrete—protect against fire. Easy-to-use fittings that make sturdy, rain- and concrete-tight joints are available in a complete range of types and sizes.

INSTALLATION ADVANTAGES OF E.M.T. make it your most practical raceway. To make tight joints, you simply tighten the fitting, not the entire run—a real aid where space is limited. Furthermore, it's lightweight—easy to handle. A bundle of ½" size—100 feet—weighs only 32 pounds.

COMPLETE INFORMATION on Republic ELECTRUNITE E.M.T., Rigid Steel Conduit and Dekoron®-Coated E.M.T. and Conduit for severe corrosive atmospheres is available upon request. Simply check desired material in coupon. And on your next job . . . specify Republic ELECTRUNITE E.M.T.

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Gentlemen:
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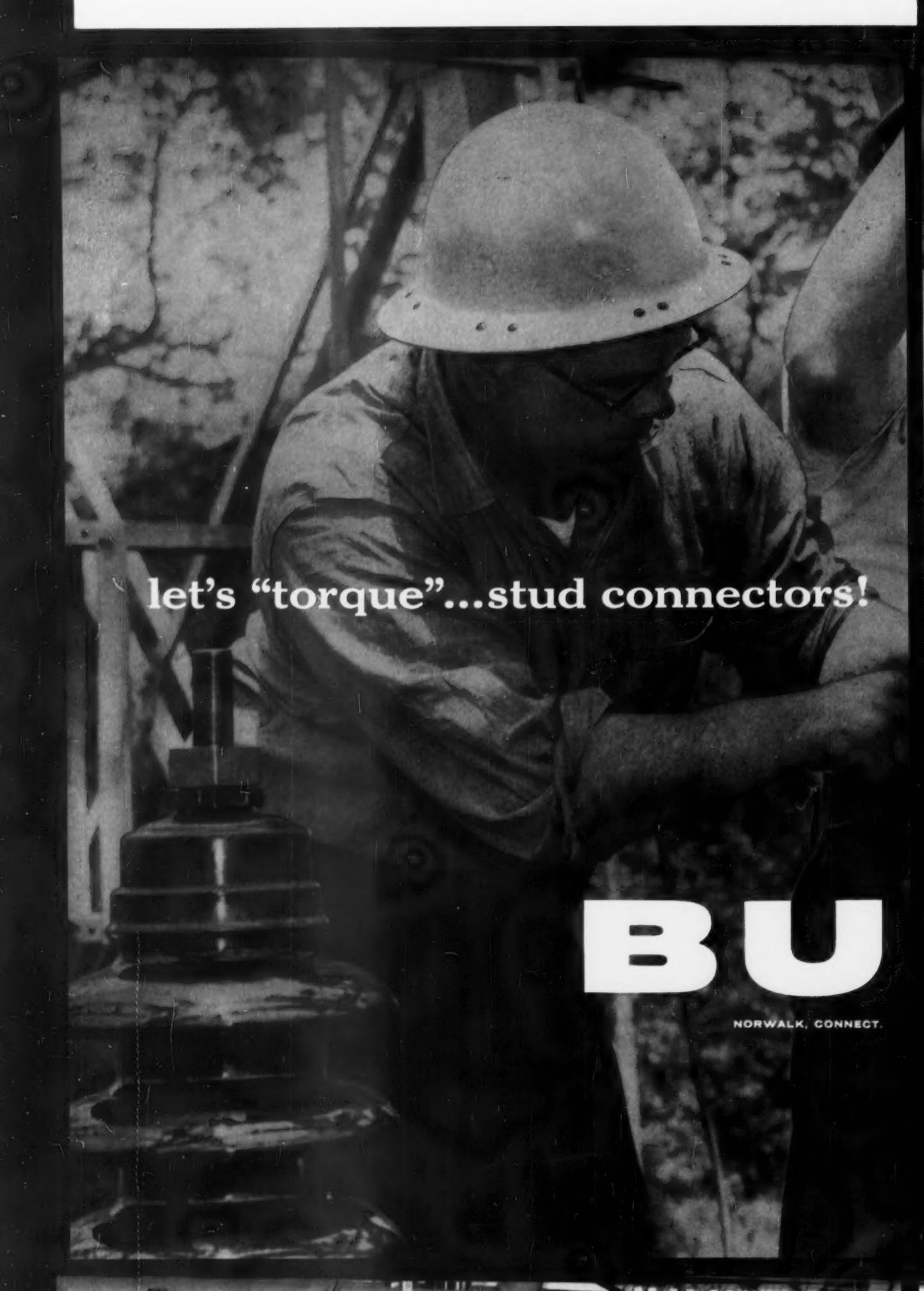
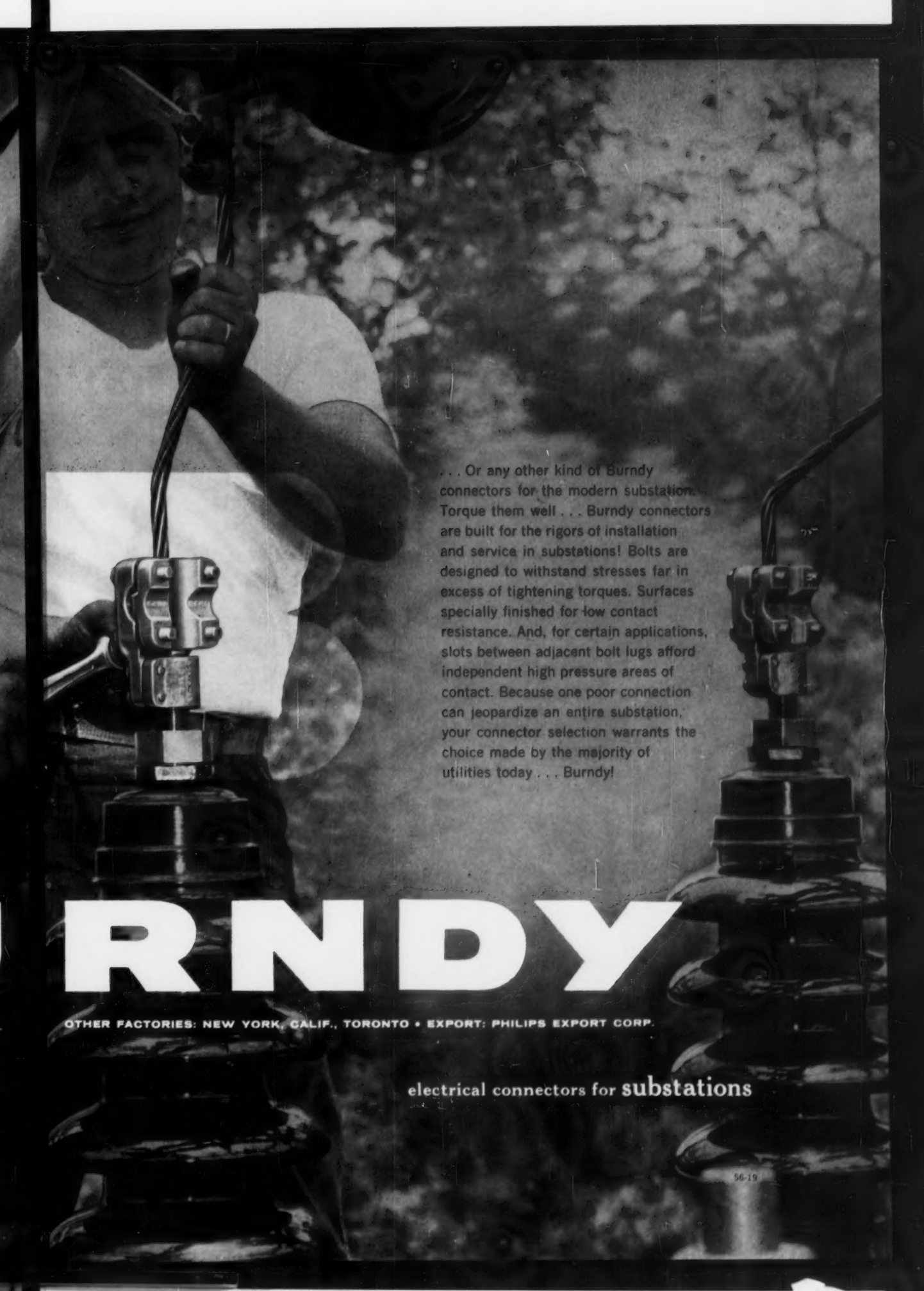
C-3011A


let's "torque"...stud connectors!
BU
NORWALK, CONNECT.


. . . Or any other kind of Burndy connectors for the modern substation. Torque them well . . . Burndy connectors are built for the rigors of installation and service in substations! Bolts are designed to withstand stresses far in excess of tightening torques. Surfaces specially finished for low contact resistance. And, for certain applications, slots between adjacent bolt lugs afford independent high pressure areas of contact. Because one poor connection can jeopardize an entire substation, your connector selection warrants the choice made by the majority of utilities today . . . Burndy!
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OTHER FACTORIES: NEW YORK, CALIF., TORONTO • EXPORT: PHILIPS EXPORT CORP.
electrical connectors for substations
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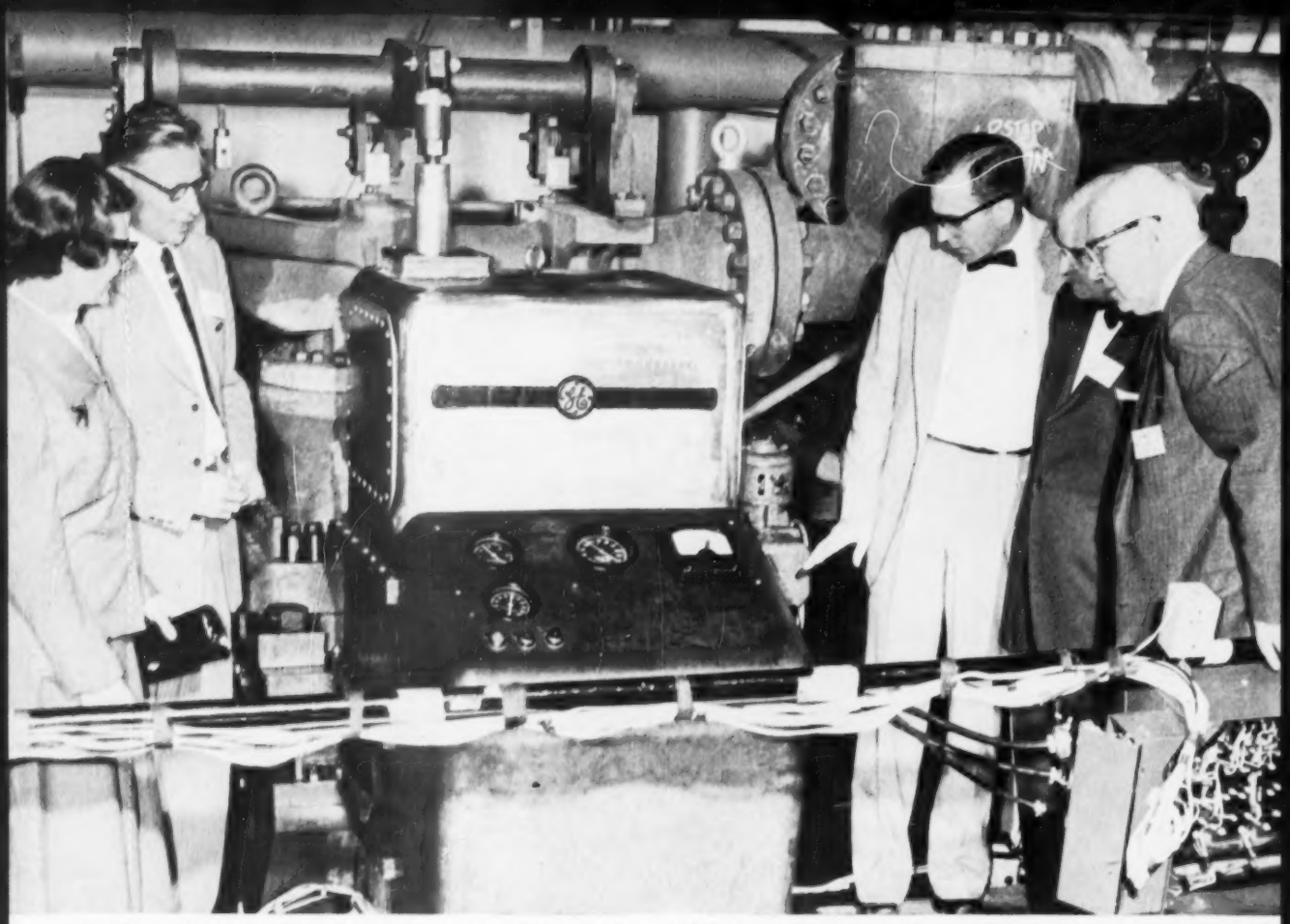
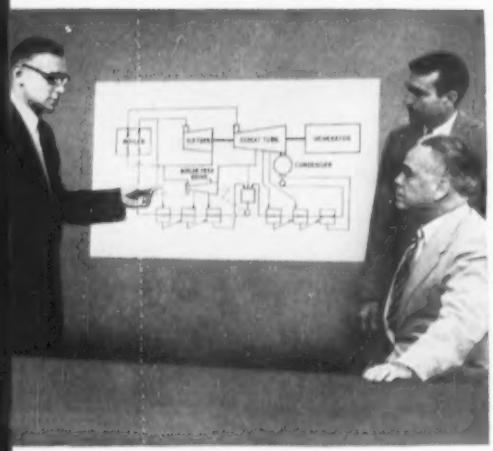


New General Electric turbine for boiler feed pump drive will be installed at the Appalachian Electric Power's Glen Lyn plant on the American Gas & Electric system. Main turbine is rated at 225,000 kw at 2000 psi, 1,050F/ 1,050F. Above, editorial personnel from utility industry publications witness testing of the first of several turbine drives for boiler feed pumps at General Electric's Small Steam Turbine Department's Fitchburg, Mass. plant.

Larger units and higher auxiliary power demands spotlight turbine drives for boiler feed pumps



DISCUSSING NEW TURBINE DRIVE for boiler feed pump applications are G. B. Warren (seated) V. P. and Gen. Mgr., G.E.'s Turbine Division, C. B. Seelig, Mgr. Mktg., (left) and S. Neal, Mgr.—Design Eng., of General Electric's Small Steam Turbine Department.

With system growth requiring more economical, larger generating units, and orders already placed for machines up to 450,000 kw having steam conditions of 3500 psig, electric utility men are focusing new attention on the use of turbines for boiler feed pumps. According to a recent study by General Electric's Small Steam Turbine Department, as well as independent studies by several utilities, significant economies result when turbine-driven pumps are used with high-pressure turbines of 200,000 kw and up.

From a system design standpoint, turbine drives for boiler feed pumps offer several advantages in that they draw less on the auxiliary power system. Result: electrical auxiliary power system requirements can be reduced, permitting lower transformer and circuit breaker ratings, and more kilowatts can be released as salable power. High-speed pumps—up to 8000 rpm—can be driven directly by turbines with the inherent advantage of variable speed.

Detailed information on the type of application where General Electric turbines for boiler feed pump drives can help you increase station output and profits may be obtained by contacting your G-E Apparatus Sales Office. General Electric Company, Section 301-333, Schenectady 5, New York.

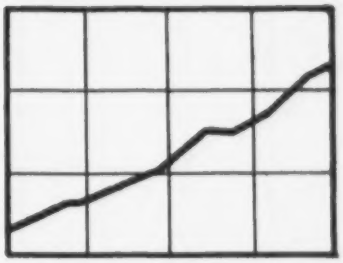
LIVE BETTER ELECTRICALLY

MORE POWER TO AMERICA

GENERAL ELECTRIC

ELECTRICAL WEST SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S. VOL. 118 NO. 1 JANUARY 1957

The old year bowed out in a flurry of statistics that may add up to a new high for business activity. The big question is whether or not the next 12 months can maintain the economic pace. Here's the consensus of business leaders who take a look at . . .



The Business Climate For 1957

Two key supports for good business are public confidence and the spending power of the three major elements of the economy, government, industry and the public. As 1956 closed, business activity was rising strongly. Next year promises to be substantially better than 1956 whether measured in terms of physical output or dollar sales. For example, the gross national product is expected to reach $435 billion compared to $410 billion in the past year. Some of this rise will represent price inflation but the balance will show up in an increased volume of goods and services.

Looking at the buoyant factors in our present business picture, business confidence is at an all-time high as the country enters 1957. There is confidence in government and in the type of legislation that may be passed by the new Congress. There's confidence in the growth of the country, both populationwise and economicwise. There's confidence in the people's age-old desire to better themselves in every way possible. In other words, there's confidence that the public's present spending mood is going to continue.

This confidence reflects itself in three key spending factors that make good business. The first of these is government spending, and in 1957 it is predicted that this government spending will go up from $78 billion to $81 billion annually. Defense spending will be at a strong $40 billion, and it is interesting to note that heavy emphasis in the defense spending will be on machines and electronics.

In the last election the people voted a new $2½ billion worth of new public works bonds. This, too, is an expression of confidence but also a very tangible contribution to the over-all economy of the nation. The Highway Bill is really a $30 billion pump-priming project if such a project should be needed. Highway funds will be another strong contributing factor in the government spending area.

Now the second factor is public spending. The income per capita in the United States at the present time is $1,770 after taxes, up $300 a head since 1948. This brings the total personal income to about $329 billion annually and that income is still rising. More important still, people are spending and they're spending rather liberally for all of the goods and services that industry is able to produce. It is now estimated that this item will rise by $5 billion in the coming year.

The third key factor is capital spending, and this is the biggest single factor in making for a good business year. This represents what business is spending for new construction and new equipment. It is not to be confused with government figures on new construction, for they represent only the new additions to the physical plant of the country.

For example, in 1957 new construction is expected to total about $46 billion. This is an all-time high rate

Table 1

Highlights on Capital Spending in 1957

(From McGraw-Hill Economics Department Survey of U. S. Business)

√ **Business capital expenditures are heading for stability at a high level. Most companies plan to increase spending in 1957 and to maintain this high level in 1958. Although this is the biggest and longest capital spending boom on record, no downturn is yet in sight.**

√ **For 1957, business now plans to increase spending 11%—compared with an increase of 21% in 1956. Plans for new plants and equipment total $40.2 billion for all business.**

√ **For 1958, about two-thirds of the companies surveyed plan to maintain or increase spending from the 1957 level. Only 30% expect a decline.**

√ **Business expects the prices paid for new plants and equipment to be about 6% higher, on the average, in 1957 than in 1956. Thus, the increase in physical volume of plant equipment to be installed next year will be about 5%, according to present plans.**

√ **Difficulties in construction, and in delivery of equipment, have delayed some 1956 expenditures until 1957. And in some industries, a part of '57 spending is being rescheduled for 1958. Cash shortages—resulting from lower profits and tight credit conditions—have also been important in some cases. However, the main effect has been to stretch out plans for expenditures. Very few cancellations are reported.**

√ **Neither the elections nor the Suez crisis has had any significant effect on plans to date.**

and up 5% over 1956. Included in this figure are $12.7 billion for housing, which will be down on the number of units but not materially below 1956 dollarwise because of increased costs. The total figure also includes $3.2 billion worth of industrial building, $3.3 billion worth of commercial building, $2.9 billion for schools and $5.8 billion for utility construction, and that latter figure, incidentally, is up 13% over 1956. Now that's the picture of new construction but it is not the whole picture.

Capital spending as contrasted to construction expenditures will be close to $40 billion (see Table 1). This money is being spent by industry, both for new construction and for new equipment. According to McGraw-Hill studies this capital spending breaks down on the average to 29% for actual new construction for this coming year and 71% for new production equipment. This capital spending is extremely important but even more important is the fact that industrial leaders are making long-range plans that indicate an unusual stability for this segment of the economy.

There are also some potentially weak spots that could develop in 1957. First, labor and material costs are rising. These costs materially affect profit and loss statements. Recent figures indicate that these rising costs have started to drive profits down in some industries and in the face of increased sales volume. A reduction in profits in turn sooner or later will affect capital spending because it is out of industrial profits that from one-half to two-thirds of new capital requirements are obtained. Lower profits also have a psychological effect on that intangible factor of business confidence. This, in turn, sometimes postpones capital spending commitments.

The second factor that might develop into a weak spot is the present tight money supply. While this particular situation has a tendency to prevent inflation, it makes business costs higher, again affecting profits. It slows private spending in the form of home buying, new car building and for other durable goods. This has an adverse effect on that factor of public spending.

Much talk is heard these days about the fact that prices are going to have to be raised. This will have a mild inflationary effect, but it is considered inevitable that 1957 will see a general price rise. Based upon the vitality of the three key spending factors the consensus of the experts is that it will be well into 1957 before any of the major weak spots could develop to a point that could materially affect the present business momentum. It's just plain hard to find a pessimistic economist these days.

The real uncertainty lies in the foreign situation. If it should develop a shooting war, all of the strong key factors in the economy would be enhanced. Probably the most dangerous threat to these prospective good times is a long, drawn-out settlement to the Suez situation. Such a delay would materially affect the economy of Europe. A depressed European economy is bound to have effects and repercussions over here. A rapid settlement of the Suez situation is essential to avoid a drain on this country's material and monetary supplies.

Outlook for the West

Western business is a reflection of the national economic picture and in many respects it's a magnified reflection.

In the West not only is population growth far outpacing the rest of the country but the per capita income is substantially higher than that recorded nationally. For example, more than a half a million people came into California during the 12-month period ending June 30 of this year. According to *Engineering News-Record*, the 11 Western states accounted for 18.3% of the contracts for engineering construction placed in the U. S. despite the fact that the West has merely 14% of the total population. The same source also indicates that the backlog of proposed engineering construction in the 11 Western states is 23.7% of U. S. total. Still another figure to indicate that the West's share of the blooming economy is larger than would be expected from a pro rata population basis is indicated by the fact that federal highway funds allocated to the 11 Western states total 20.3% of the U. S. total.

All this would indicate that the Western region will enjoy a full measure of the economic gains that 1957 will bring. By every index and in every category the West may look forward to an exceedingly prosperous new year.

A Financial Viewpoint on '57

It is assumed that business conditions in 1957 will be good and that utility operating revenues and income also will be high, probably higher than in 1956.

J. R. Beckett
Blythe & Co.

The outlook for utilities is not only favorable for next year but appears bright for many years ahead, especially here in the West, where population and business are growing so rapidly. To meet the increased needs for service brought about by this growth, utility construction budgets for the foreseeable future are substantial. Thus utilities must continue to attract large amounts of new capital.

Fortunately, since investors recognize the splendid outlook for utilities, utility securities as a group have the highest kind of investment status and rating. As a consequence of the favorable outlook and investor acceptance, utility financings in 1957 generally should be well received.

Some utilities, however, are in a better position to secure new funds on favorable terms than are others. Especially is this the case for those companies that operate in areas where regulatory commissions are realistic and, recognizing that good earning power is needed to attract new capital, allow utility companies to earn a reasonable rate of return on their investment. Naturally such companies are in a better position to follow sound financial programs during 1957—choosing carefully between the sale of bonds, preferred stock or common stock—than are those companies operating in areas where commissions fail to recognize that utilities are in competition for new funds with industry and with states and municipalities generally.

To be specific, insofar as the 1957 market for new capital is concerned, it is expected that:

Interest rates will be relatively high. Utilities selling bonds must be prepared to give institutions and investors high yield and high call price provisions. In short, while mortgage money will be available, it will be expensive as compared with the rates of the postwar years. Utilities selling bond issues (and institutional preferred issues as well) will need to judge carefully the timing and size of their respective offerings because, while money is available, it is not available at the going rates in unlimited amounts at any one time (for example, a utility desiring $20,000,000 of mortgage money may

find it expedient to have two issues of $10,000,000 each, with a time interval between the offerings). Sometime in 1957, probably toward the latter part, interest rates may start downward. The movement, however, probably will be very gradual and not spectacular. Many institutional investors already have forward commitments for loans that will be taken down in the latter part of 1957 and, even if there is a slowdown in demand for funds, the supply of loanable funds has some catching up to do.

Straight preferred stock financing will be difficult. Preferred stock dividend rates are high and may go higher; thus, they probably will be not too attractive to issuing utilities when compared with rates of return allowed by regulatory commission. Recognizing this, many utilities may well turn to offerings of preferred stock with conversion privileges since investors will accept such securities on a significantly lower yield basis. The recent offerings of convertible preferred issues by Pacific Lighting Corp. and Arizona Public Service Corp. are examples of this trend in preferred stock financing.

Utility common stock financings probably will be at lower prices relative to earnings and dividends than was the case in 1956. In spite of their recognized excellent defensive characteristics, it appears that investors currently are re-evaluating downward what they will pay for present and anticipated future earnings and dividends of utility common stocks. Generally speaking, as interest rates go up and as attractive investments become available in tax-free state and municipal securities, as well as industrial convertible debenture issues, convertible preferred issues, and so on, earnings and dividends for utilities (particularly dividends) are being capitalized on a more conservative basis.

In regard to all kinds of new money offerings, it is evident that more intensive selling efforts will be required. As a result, all new money will cost more and underwriting expenses also will increase.

A Labor Viewpoint on '57

1957 will be a good labor year.

We base this statement on the premise that good business times are good labor times. Equally important to the labor scene is the atmosphere of respect and confidence that has grown between our union and the many employers in the four states and two territories represented by our district. We have tried to deserve this reputation by being aggressive and progressive without being irresponsible. I emphasize this point to make clear the obligation of all of us to bring about healthy mutual growth in the electrical industry. With cooperation, the forthcoming year will be free of labor problems and the accompanying bitterness and hardship that we have seen in the east in recent years.

O. G. Harbak
District 9 VP, IBEW

While stating that the prospects for 1957 are good, we should perhaps comment that the growth of the electrical industry, which we hear so much about in terms of increased plant capacity and capitalization, can be measured equally well by the increasing numbers and competence of our electrical workers and linemen. We accept as one of the responsibilities of union management the challenge to augment our work force through the addition of competent newcomers to the trade. Our union, naturally, welcomed nearly a hundred thousand new members to its rolls this year. Of real significance is that this is not growth for growth's sake alone but growth in tune with the electrical industry. We pledge the industry continued growth, once again, in tune with the industry.

Many people has asked my reaction to the present political climate. We are pleased with the growth of the Democratic majority in the Senate and particularly pleased with the developments in the Northwest. The obvious fact that the nation's voters prefer to retain President Eisenhower as chief executive causes me to feel that his administration will recognize the obligation it has to American labor. For the record, may I make a comment on the meaning of the election in the Northwest from the labor viewpoint. One could conclude from the fact that we supported the pro-public power candidates that we as a union are pro-public power. On the contrary, our union supports the principles of private-investor type of ownership. On the other hand, we have many members earning their livings with REAs, municipals and government power agencies with whom we have agreements and we do not intend to use our influence as the representatives of these people to enforce our political or philosophical views. We have agreements with employers on both sides of the fence. We will be fair with any employer who is fair with our membership.

I have also been asked to comment on automation in the electrical industry. I am in favor of automation. We are able to observe that the increased use of automatic machinery creates more total jobs in the industry. The electrical industry is the automation industry, so we should do all we can to further this inevitable and beneficial change. Labor's only opposition, which is justified, is in areas where rapid improvements in methods materially affect the security or income of large groups of working people. We don't see automation as a serious threat or problem to our industry. We must handle hardship cases with understanding, but at the same time we must recognize the advantages that new methods offer in terms of more goods and services at lower prices. Another benefit to the working man is the tendency for new jobs to be more technical, higher paying jobs, which is more satisfying to the individual.

Looking forward with enthusiasm to 1957, we might comment on the opportunity that the Live Better . . . *Electrically* program presents to us. Today's home is lavishly packed with plumbing fixtures, tile, brick and fancy paneling. The same home is oftentimes not adequately wired and very seldom is it fully electrified. Understand now that I do not oppose or underestimate the charm and utility brought about by the fruits of the other trades. The problem is that we as an industry have been outsold by the suppliers and associations representing these competing devices. The man with two cars feels that he cannot afford a heat pump. The man with two bathrooms cannot afford color TV. The man with two fireplaces goes without outdoor lighting. Our industry has an obligation to Mr. and Mrs. America to let them know of the benefits to them from adequate and complete electrical living.

While it is not my province to direct such campaigns, it would seem that manufacturers and industry groups should concentrate first on Mrs. America (never underestimate Milady) and second on the contractor and the architect. Unless Milady wants, the architect understands and the contractor is familiar with the new device it will never get into our homes. Live Better . . . *Electrically* and the Housepower campaigns have done a great deal al-

ready. They must be continued and expanded if possible. They have our full support. From the labor viewpoint, we feel that these programs provide a driving economic force that we are only beginning to enjoy in the electrical industry. Here again, what is good for labor is equally good for business.

Top Management's Viewpoint on '57

As has been the situation with the electric utility industry of the West over recent years, 1957 will bring with it the recurring problem of raising the truly enormous sums of venture capital required to provide an adequate supply of power for the ever - expanding demands of our rapidly growing population, whose standards of living are continuing to increase at a spectacular pace under the impetus of higher levels of family incomes and the availability of new products and conveniences. At the same time, other basic industries, through research and scientific advancements, are making rapid strides in new fields where electric service is an important component.

T. E. Roach
Idaho Power

Facing the investor-owned electric utility companies, therefore, is the task of maintaining adequate skilled manpower with which to rapidly expedite plans and construction programs which will insure that power supply responsibilities will be fully met, doing it at reasonable investment costs, notwithstanding the continuing inflationary price trends and mounting costs of capital funds, while resisting the continuing harassments and political obstacles placed in their paths.

Going hand in hand with the physical and financial problems is the ever-important and urgent necessity of carrying forward a constructive effort directed to preserving and improving our customer, public and investor relations to the end that we shall have from these groups not only a friendly and informed appreciation of the difficulties involved in meeting our public service and ownership responsibilities but also an active endorsement and assistance in achieving our objectives. The electric power industry has learned to its sorrow that performance of public responsibility alone does not insure public approbation. Our story has not been effectively told.

And while mastering its pressing day-by-day problems in 1957, our industry faces the important and urgent task of joining together in an aggressive and well-directed effort to speed the intelligent and sound development of nuclear energy utilization for peacetime application in accordance with accepted American principles. It is in this new field where we will find our greatest opportunity to utilize the experiences, skills and resourcefulness of our industry people for the benefit of mankind. Here we will find our most exciting challenge in the years ahead.

On the broader front, the genuine interest of the industry in the community and social welfare of the citizens of the country will be tested in the fire of civic activities. The extent to which industry personnel participate and provide leadership will measure the depth and sincerity of our appreciation of the problems of community health and welfare and whether we fully meet the test of good citizenship.

In these complex times and difficult individual situations the successful solution of our problems challenges the initiative and resourcefulness of the investor-owned utility people and their manufacturing and other allies as well. Boldness and imagination in moving forward on all fronts in the development of new methods, materials and approaches are vital if we are to measure up to our obligations and if we are to convincingly demonstrate the superiority of individual enterprise and its ability to cope with and overcome what at times seem to be insurmountable and discouraging obstacles.

In facing up to the problems and challenges of 1957 and the years to follow, I hearken back to a talk recently delivered before the Rotary Club of Los Angeles by Brewster Jennings, President of Socony Mobile Oil Co., which greatly impressed me because in words better than any of mine Jennings tells how the challenge of the future, which confronts not only industry but civilization itself, can best be met. Here is the way he puts it:

"Basically, the problems of the second half of this century seem likely to differ from those of the first half more in size than in nature. If we are wise enough to recognize the sources of our progress in the past, we may see how to maintain and increase it in the future.

"Man's greatest discovery is not fire, or the wheel, or the internal combustion engine, or atomic energy, or anything in the material world. *It is in the world of ideas.* Man's greatest discovery is teamwork by agreement."

In 1957 teamwork within individual companies, within areas and within industry as a whole will provide the key that will open the door to a year of promise and a year of achievement in again meeting our obligations in a manner which will bring credit to the investor-owned utilities and their industry allies for a job well done.

A Purchasing Viewpoint on '57

The year 1957 has a fair chance of being one of the most rewarding years for the purchasing profession; it also can present some of its biggest headaches. New machines, new materials, new processes and new products are creating dynamic changes in all industry and these changes are naturally reflected in the purchasing field.

Walter Sterling
Arizona PS

There is the problem of recognizing change advantage in relation to a tried and true product. One must sell a new product idea first to our respective engineering departments and then to the operating people. One must prove that it is cheaper—suggest that it might be superior—find reliable and competitive suppliers. This perpetual effort in choosing and eliminating is a constant challenge to a buyer. Adjustments to these rapid changes in today's markets demand more research, more imagination and a flexible purchasing attitude.

Objective inventory control is a mighty must in these times when world conditions cannot help but influence domestic markets. Restricted and tightened governmental monetary policies make it more important than at any other time in the past 10 years to keep inventories in economic balance with the capital structure of one's company.

It appears that we are generally committed to a creeping inflationary spiral as to wages and material costs.

Some of these price increases are completely justified; others are simply requested on the basis of obtaining "all the traffic will bear." It is the pattern that we, as purchasing executives, must fight with every means we have at our command.

Too often so-called speculative buying causes artificial shortages which, in the final result, more than eliminate any cost savings in the initial purchase. This phase of buying will require the greatest consideration and caution during the coming year. The present foreign situation is one which can well promote hysteria in our buying effort. It is our duty to control to the best of our ability this explosive situation.

A PR Viewpoint on '57

Any review of West Coast advertising and public relation programs, conducted during 1956, should be headed by an observation that although budgets have been increased so has the effective thought content of our advertisements and other forms of communication with customers. Electric sales were greatly stimulated through a unification of effort conducted under the direction of the Live Better . . . *Electrically* committee. This industry-wide promotion gained considerable momentum during the year and will receive even greater impetus during 1957. Electric appliance dealers are just beginning to recognize the potent punch of these "buy words." Its companion promotion, Housepower, has likewise been forcibly presented to an interested public. It, too, is well "off the ground" and on the way to becoming a national "byword." The leadership set by the Edison Electric Institute and several electric appliance manufacturers in support of these promotions should earn the gratitude of the entire electric industry. The publicity and display material offered by the LBE and Housepower committees, at nominal cost and in some instances without charge, has been well considered and a creditable companion to local tie-ins and use.

F. M. Raymond
San Diego G&E

As a representative of a combination company, some comment should be made under a heading of "regrettable." I refer to the "Only Gas has . . ." and "Faster than Gas" comparables that crept into utility and factory advertising during the year. Fortunately, most Western utility advertising was conservative in the use of such competitive inferences. It relied on an intelligent public to believe tastily presented facts not intended to wreck public confidence in competitors.

Utility advertising is serving its purpose best in the field of "reason why." It is natural that the manufacturer's advertisement should emphasize the distinguishing features of its particular product (the nuts and bolts story); also, that the appliance dealer should say "Come and get it—at my price." The utility, then, has a man-sized job of telling the prospective customer the *reason why* he should own what the manufacturer and the dealer offers. The fact that appliance sales have continued on a remarkable upward trend indicates that all three segments of the promotional team have been doing a splendid job. This same reasoning also applies to the promotion of lighting (residential, commercial, industrial) and power (industrial, commercial, agricultural). The latter tasks are more tailor-made to local economy and sometimes require more consideration than mass market promotions.

There is a concerted effort on the part of all utilities to place more emphasis on the promotion of off-peak items. Here again there is every indication that a good job is being done. The rapid public approval of the electric dryer is due largely to utility advertising; in fact, all of the newer items must have utility and factory promotion before volume sales warrant much advertising expenditure on the part of the dealer.

The art of maintaining friendly contacts with customers is the painstaking task of conscientious public relations advisers working closely with all de-

CAPITAL SPENDING will go up eleven per cent.

Westinghouse Photo

GOVERNMENT SPENDING will rise three per cent

Caterpillar Tractor Photo

partments of public contact and communication. Due to proper advance preparation, necessary rate increases have been instituted with a minimum of public disapproval. Likewise, the growth story has been told so well that delays in service connections are easier to explain and accepted with confidence. The fact that a utility representative is often asked to assume leadership in the conduct of important civic projects proves that the old "power trust" era has long passed and the public now knows that a public utility renders a desirable public service at reasonable rates and can be trusted. Our school authorities no longer hesitate to ask for utility help. Our visual education programs are in constant public demand. Our farmers and industrialists depend upon utility advisers for guidance. Such is the objective and achievement of most public relations programs. They are here to stay and are continually asked to perform more important tasks in the fields of product promotion and public understanding.

An Engineering Viewpoint on '57

The following are suggested as among the more important opportunities and challenges of utility engineering during 1957. Stating them for 1957, however, implies that they may be fully exploited during that year. Actually, they will be current in 1957 but most of them will require some years for solution.

W. L. Chadwick
Edison Co.

These challenges and opportunities lie in four great areas with which all modern business management is increasingly concerned, namely, men, money, materials and apparatus. As to men, in utility engineering a way must be found to interest an increasing number of the more talented graduates in power engineering. To do so, the glamour of some of the newer branches of engineering must be offset by developing an inspired interest in the large problems yet to be solved in mass generation, in transmission and distribution, in apparatus development and manufacture, in the satisfaction that comes from rendering, in high quality, an essential and valued public service, and in the many opportunities that exist in the industry for the best management skills. This will require much high-level interest, action and probably some of the best industry advertising.

As to money, the challenge to find more economical ways to build better systems is increasingly present. The demand for new plant to supply increasing load requires more and more new capital. Tight regulation still controls the product price and there is no ready way to offset increases in the cost of fuel, labor, apparatus and construction materials. The investor must have an adequate incentive to keep him supplying new capital. Tax loads on property continue to mount. Engineering has the key challenge to find simpler, more economical ways to build and operate electric utility plant to the end that the product can continue to be supplied at the lowest possible price that will yet leave the investor an attractive earning.

With respect to materials, the two great areas of opportunity and challenge are those of metals and fuels. Solution will bring handsome rewards to the industry. Sometimes our era has been called the age of super alloys. Unfortunately, our best alloys still aren't super enough. The future of super temperature steam and nuclear power generation are both dependent upon a break-through in knowledge to allow the perfection of metals that will withstand 1,200 to 1,500 F for 200,000 hours without wastage or loss of strength. Nuclear power development requires such metals even more than super temperature steam. Better ways of making large forgings and better ways of controlling ductibility at lower temperature are two other essentials. The need for a great amount of fundamental work in solid physics is strongly suggested.

Fuel problems are of two kinds. One is the need for processes of beneficiation that will remove, economically, potential air pollutants and corroders from the fuel before it is burned. Much important research work is yet to be done before air pollution from combustion gases will be minimized. This is an important industry problem which must soon be solved objectively. The other kind of fuel problem is that of supply and handling. How should systems be designed to make the best use of the fuels that will have economic preference in the future? What method of handling them will best offset the ever-increased cost of transportation? This question suggests the whole field of nuclear application, which can only be mentioned here. What reactor principal and heat cycle have the best prospect of producing commercially competitive power at the earliest date? Plenty of opportunity will come to those who solve these problems economically.

In the area of apparatus, circuit breaker development still is not adequate. Unhappily, this is apparatus which, in the higher duties, we still cannot test before full duty is required, yet system and customer safety depend on its proper functioning. Breakers that are bought and installed today may not be required to perform fully until the system load has grown to double or treble the present. When today's breaker is called upon to interrupt millions of kva 10 or more years hence, will it perform at its full rating to clear a fault? The opportunities are great for whomever supplies this need for certain performance at rated duties. Again, in the apparatus area, what is the best system design and apparatus selection for double, treble and quadruple today's system load? How best may short circuit duties be minimized? How can large interconnected systems be better regulated to assure the protection and economy of interconnection without excessive swings? How can systems be better designed to more nearly standardize substations and protection so that, as systems become more complex, the tax of variation on designer and operator will be reduced?

These are but a few of today's opportunities and challenges to the utility engineer. But for space, many others could be listed. Can there be doubt that power engineering is still a virile field with opportunity and challenge for courage, ingenuity and skill?

CONSUMER SPENDING headed upward

Western utilities will

- **Spend $18,500,000 on load building**
- **Expand use of TV**
- **Push LBE and Housepower programs**
- **Extend use of demonstration homes**

Biggest Promotion Year Ahead

In 1957, Western utilities will step up load building activities to a new postwar high. This is the essence of the reports received in ELECTRICAL WEST's year-end survey of commercial executives in the 11 Western states, Hawaii and Alaska. Responding utilities represented 86% of total meters in that area, making the survey one of the most comprehensive of its type and enabling a relatively accurate prediction of things to come in the load promotional area during the coming year.

Survey Highlights

Highlights of the tabulated results include these facts:

—Public service companies will spend approximately $18,500,000 ($2.56 per meter) on load development during the year.

—Heavy promotional emphasis will be placed behind ranges and dryers.

—Promotional expenditures will represent about 1.5% of gross revenues.

—More than 1,200 utility employees will engage in full-time selling and promotional activities.

This is strong local support for the national load building effort by individual appliance manufacturers, and national organizations such as NEMA and EEI, which is estimated to represent expenditures of between $325,000,000 and $375,000,000 next year. That's the approximate price tag for the TV programs, general magazine advertising, national contests and all the other methods of mass communication used to reach the U. S. homemakers with the electrical living story. Apparently Western utilities are out to translate the customer interest and desire created by the national program into actual sales of load building devices.

Promotional activities for 1957 will follow the pattern shown in the accompanying chart. Slated for heavy promotional emphasis on ranges and dryers, most utilities will build their promotional campaigns around these two items. However, it is significant that the two newcomers in 1956—the Live Better . . . *Electrically* and Housepower campaigns—have climbed to the top of the promotional pile within a few short months.

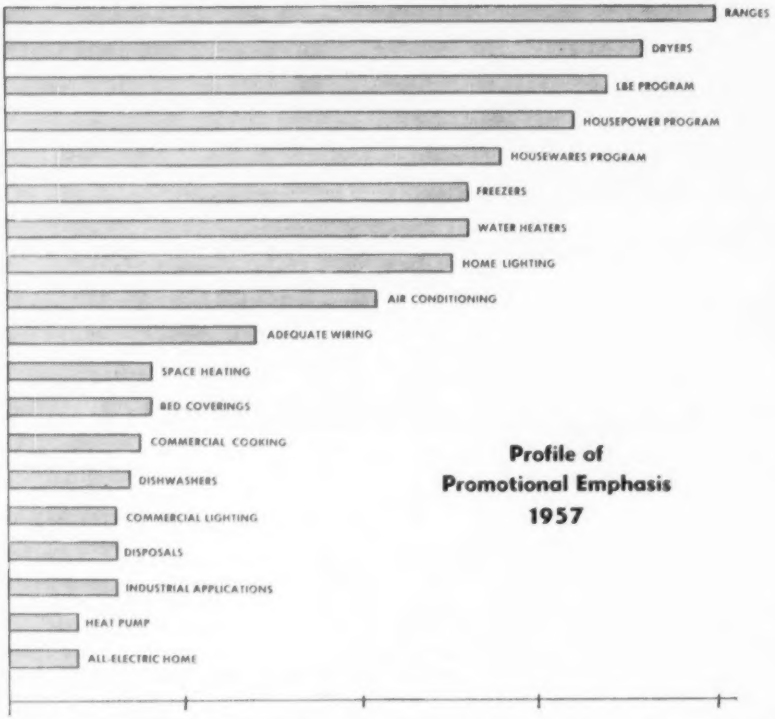
Also of interest among the comments received from the companies is the combining of promotional activities with institutional objectives. For example, one company is embodying a public relations campaign on rates with its promotional program. Another is emphasizing its extensive and expensive construction program as evidence of its ability to serve.

In the Northwest there was an increasing awareness of gas competition. Several utilities are offering subsidies for sales that replace flame-type equipment. The City of Seattle, for example, is offering a $55 wiring subsidy for users who replace with an electric range or 50-gal or larger water heater.

It is somewhat disappointing to see the lack of specific attention that some of the more promising revenue-building appliances, such as the heat pump

Live shows continue to be popular. This exhibit at the 1956 Orange show, San Bernardino, was sponsored by Calectric and Edison; was seen by 233,000 people in two weeks

"Beats hanging up clothes"
ELECTRIC DRYERS dry better than sunshine
17 AUTOMATIC Clothes DRYERS GIVEN AWAY FREE
Here's all you do to win...
DISLIKE LAUNDRY THAT DRIES STIFF AS A BOARD?...
SEE YOUR DEALER TODAY FOR A FREE DEMONSTRATION!
AUTOMATIC DRYERS dry clothes better than sunshine fluffy soft too
BUREAU OF HOME APPLIANCES OF SAN DIEGO COUNTY
WHICH WIFE ARE YOU?
get an electric CLOTHES DRYER and banish the clothesline barrier!
THE HAWAIIAN ELECTRIC CO., LTD.



Relative picture of utility promotion, showing how various items stack up numerically

and bed coverings, received. However, there appears to be a much stronger effort toward promoting all-electric living in general through local support of the national campaigns, all-electric demonstration homes and TV-radio presentations.

Promotional Media

Utilities are becoming more advertising minded. This is reflected in a growing use of TV and the almost universal use of all other forms of communication with the public. The smaller utilities, of necessity, are restricted to the use of newspapers and radio spots. However, many of them are also using direct mail, bill stuffers and similar methods of promoting electrical use. The larger companies have moved into the use of TV, not only for spot announcements and demonstrations but also as sponsors of appropriate half-hour programs.

Whether by oversight or not, the use of some of the most inexpensive and effective promotional tools was not reported by a large number of companies. Such things as bill stuffers, display posters on company vehicles are being overlooked, either in the reporting or in actual employment to tell the electrical living story.

Electric dryers were second only to ranges in promotional programs being planned by the Western utilities for the coming months

Promotional Tools—As Reported by Selected Utilities

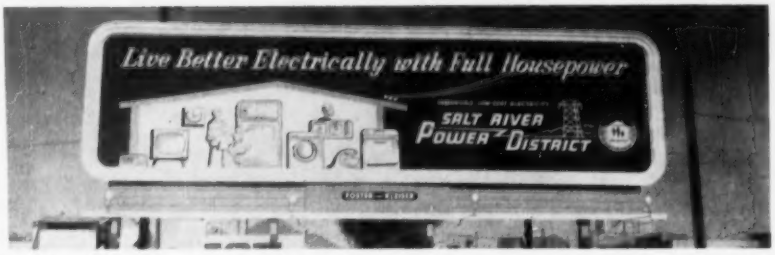
Company	TV	Outdoor Advertising	Newspaper	Radio	Direct Mail	Bill Stuffers	Bus and Car Cards	Truck Posters
Arizona PS	"Science Fiction Theater" plus news program	None	Weekly ads in all papers	15-minute newscast	For special campaigns	N. R.	N. R.	N. R.
Salt River Power Dist.	½-hour program plus 4 spots	Yes	Yes	15-minute newscast, 5 nights/week	N. R.	N. R.	Yes	N. R.
B. C. Electric, Vancouver	Spots	Yes	Full schedule	15-minute gardening program, 5-min. noon-time spot, 5 days/week	N. R.	N. R.	Yes	N. R.
B. C. Electric, Victoria	Sunday newscast, 7 p.m.	Yes	100 lines per month	Evening newscasts, 5 days/week	For selected list	N. R.	Yes	N. R.
Calif. Elec. Power			Full schedule	On 4 stations not capable of receiving Los Angeles	N. R.	N. R.	N. R.	Company vehicles
Calif. Pacific Utilities			Yes	Daily newscasts	N. R.	Yes	N. R.	N. R.
Los Angeles Dept. of W&P	Spots	Yes	Full schedule		N. R.	N. R.	3,000 vehicles	N. R.
Modesto Irrig. Dist.				Spots and 15-minute newscasts				
Pacific G and E	"O Henry Playhouse" for full year on 8 stations	404 locations 6 changes per year	Full schedule throughout territory, average 21 ads/month		Customer bulletins	Every month	N. R.	2,500 company trucks
Sacramento MUD	Spots	22 locations	Full schedule	1,000 spots/year	N. R.	N. R.	Yes	N. R.
San Diego G&E	Weathercast 4 days/week	Yes	Full schedule	"Home on the Ranch" twice daily, 5 days/week	Yes	N. R.	N. R.	N. R.
Southern Calif. Edison	½-hour audience participation show from SCE Electric Living Centers	Yes	Full schedule, including Sunday Pictorial Living Section	N. R.	To dealers	N. R.	N. R.	N. R.
PS of Colorado	"Halls of Ivy" program through '57	4 locations	Yes	Spots	Customers monthly bulletin	N. R.	N. R.	N. R.
Hawaiian Elec.	Spots (may sponsor 1-hour movie)	None	Full schedule	Spots; 1-hour musical show weekly; sponsor of 12 concert programs, Hawaiian Symphony; 1-hour weekly Royal Hawaiian Band concert	Yes	N. R.	Yes	N. R.
Idaho Power	"Electric Theater" and spots	N. R.	N. R.	1 spot per day; 1-hour "Melody Hour" Monday night	Yes	N. R.	N. R.	N. R.
Calif. Oregon Power	½ hour per week plus spots	None	Yes	Spots	N. R.	N. R.	N. R.	N. R.
Pacific P&L	"O Henry Playhouse" program	14 locations	Full schedule	15-minute musical show, twice/week	Customer and farm bulletins	N. R.	N. R.	N. R.
Utah P&L	Demonstrations, spots	98 locations	Full schedule	Spots	Dealer bulletin and other customer items	N. R.	150 buses	N. R.
PUD of Franklin Co., Wash.	Spots, 1 per week	1 location (rotated)	Regular schedule	Spots	Yes	N. R.	N. R.	N. R.

Demonstrations Popular

Live shows in the form of model homes, exhibits, cooking schools and portable demonstrations will play a big part in 1957 promotional programs. Thirteen of the larger companies are participating in the Parade of Homes activities and nearly all will have one or more exhibits at state and county fairs. County fair exhibits are almost 100% endorsed by the PUD and REA organizations as a means of telling their load building story.

Ten utilities have traveling exhibits ranging in scope from Public Service Co. of Colorado's House of Magic to Portland General Electric's scale model of the all-electric home. Idaho Power probably will repeat its highly success-

Utility home economics departments give a real community service, make many friends



Outdoor advertising is a promotional tool that is being used effectively. Salt River Power District took a prominent location to promote the LBE and Housepower programs

B. C. Electric at Vancouver promotes individual appliances on outdoor poster boards

PG and E used this effective poster on bill stuffers as well as on trucks and outdoor signs

Transit bus cards are one media used by San Diego Gas & Electric to sell electric services

all joking aside
California Electric Power Company
TV: Twice as much fun with a second set!
PG E
I AM AN ELECTRICIAN
Cheyenne Light, Fuel & Power Co.

Utility newspaper advertising will promote special occasion giving, as well as particular appliances. Institutional ads also pull well

ful All-Electric Caravan of 1956 with a new look. Relatively few companies have permanent exhibits except those in office lobbies and district offices. These are largely floor displays changed according to the promotional season or hospitality rooms set up for cooking schools and other meetings. Several companies also have permanent adequate wiring exhibits at one or more of these locations.

Cooking schools will get a big play this coming year. Twenty-one utilities reported their specific programs on this item and the total of adult and high school cooking demonstrations scheduled reached 4,846. Industry home economists will be exceptionally busy for the next 12 months.

Fourteen of the utilities reporting provide a full-scale kitchen planning service including layouts. Most others furnish advisory service through their home economics department. Idaho Power expects to add a planning department this year.

Southern California Edison reported that its kitchen planning service averages about 450 suggested kitchen layouts per year, indicating the scope of its program in this area.

Twelve companies, not necessarily the same as those offering kitchen planning, offer full-scale home lighting services. Hawaiian Electric Co. extends this service to cover garden lighting layouts and makes actual garden lighting demonstrations with a complete outdoor kit to homeowners, women's clubs and builders associations.

Commercial and Industrial

While the survey was basically aimed at activities to promote residential load building, one question spotlighted commercial and industrial load promotion activities. From it, it is possible to state that considerable work will be done in the field of commercial cooking, commercial and industrial lighting and adequate wiring in both the store and factory categories.

In the commercial cooking category, California Electric Power will lend counter equipment for demonstration and the Sacramento Utility District has solved the wiring problem that permits actual demonstration of large equipment on the customers' premises. Pacific Gas and Electric uses commercial electric cooking schools to sell the idea to restaurateurs. Portland General Electric plans for greater emphasis in this area next year.

Most companies are using conventional methods of promoting wiring and lighting. The importance of this phase of load building was evidenced by the large number of respondents who made specific reference to their promotional plans for these items. Personal selling, direct mail and advisory service to architects and contractors were high on the list of methods to be employed next year.

In summary, the survey indicates a renewed interest and vitality in load promotion. Western utilities, despite great growth predictions for the future and great construction programs to meet that growth, apparently are not standing by to await load gains. The programs for '57 indicate that most systems will be pushing ahead to insure that residential and commercial load growth keeps pace with the dynamic industrial expansion that is characteristic of the region west of the Rockies.

Exhibits like this one of Portland General Electric Co. will be used extensively in 1957

Live Better . . . Electrically, the first all-industry electric program, was launched on Feb. 8, 1956, with the nation's biggest closed-circuit telecast. Beamed to audiences in 80 cities by 100 sponsoring utilities, the live telecast reached 40,000 industry leaders and a kinescope was seen by many more thousands in group meetings. As the program neared the end of its first year, the editors of Electrical West asked Frank Falge, LBE director for the eight Western states, to summarize progress in the 11 months and to predict what is to come. His report leaves no doubt that the industry is off to a good start on the . . .

Live Better . . . Electrically Program

When the Live Better . . . *Electrically* program was still only a gleam in its parents' eyes, the thought was expressed that if 25 utilities participated in the program in 1956 that would be good performance for the first year. But just like presidential polls, business prognosticators can be wrong. More than 300 utilities actively participated in the program in 1956, and in the 11 Western states 78 used Live Better . . . *Electrically* actively to build their load and to help electrical manufacturers, distributors, dealers and contractors to sell more electrical products. An estimate of the money being spent participating in utility promotional programs indicates a figure of almost $100,000,000. In the 11 Western states an expenditure of about 10c per meter for Live Better . . . *Electrically* alone is indicated or a total of about $800,000. One large Western utility is spending 30c per meter.

That more than 50% of the electric utilities are using the Live Better . . . *Electrically* emblem or slogan or both is indicated by the current edition of the PUAA Advertising Exchange Service. In a total of 390 ads, 218 included Live Better . . . *Electrically*.

Manufacturers Tie In

Electrical manufacturers will spend on space advertising in 1957 over $250,000,000. Live Better . . . *Electrically* is a natural tie-in for these manufacturers and many of them are using the Live Better . . . *Electrically* emblem and slogan in their magazine ads and their TV and radio programs. In the West, one manufacturer uses the Live Better . . . *Electrically* theme song with special words for its radio program. Another has used the theme for one of its TV commercials. In the Los Angeles area, a manufacturer's branch tied in to the electric cooking promotions with a Live Better . . . *Electrically* window display contest and a special employee range offer.

"But," you may be saying to yourself, "what has been accomplished? What are the results?" After only eight months, it is still too early to appraise results accurately but here are some important developments in 1956, partially or completely due to the Live Better . . . *Electrically* promotion.

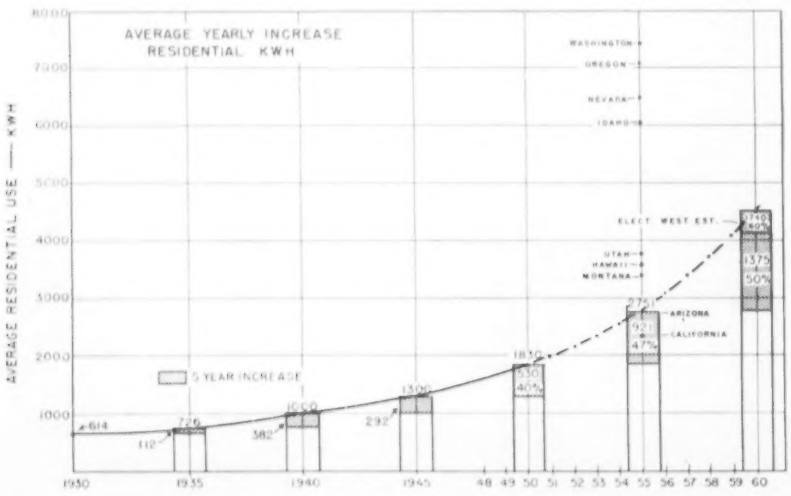


Fig. 1—Increased residential electric use, 1930-1955; probable curve from 1955 to 1960

People Want To Live Better . . . Electrically

Yes, people want to Live Better . . . *Electrically*. Let's look at *Sunset* magazine's 1954 survey of appliances in the 11 Western states.

In the northwest 93.3% of their readers had electric ranges and 96% preferred them.

In the central area 39.2% had electric ranges and 83.5% preferred them.

In the south 27.4% had electric ranges and 67.3% preferred them.

In the Los Angeles area more and more builders are finding (as did the West America Construction Co. with its Park Glen Oaks tract of 151 units and Park Walnutdale with 125 houses) that, given a choice, the majority of buyers want an electric range and other electrical conveniences.

Indicative of this rapidly growing desire for electric living is the set of

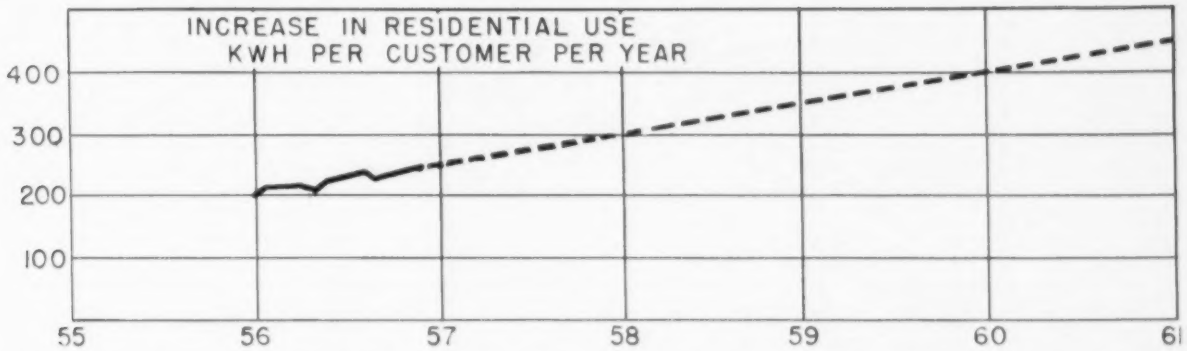


Fig. 2—Expected increase in residential kwh use per customer from 1956 through 1961, predicting exact objective of the LBE program

range sales figures for northern California, shown in the following table.

9-Month Sales of Ranges
Northern California

	1955		1956	
	Units	%	Units	%
Electric	30,879	41	36,869	50
Gas	44,140	59	36,637	50
Total	75,019	100	73,506	100

Progress in Southern California

With residential usage of electricity below the national average, Southern California Edison Co. embarked on a promotional program early in 1955 to correct this situation. During the latter half of 1955 its efforts began to bear fruit and the curve of average usage of electricity turned upward. In the fall of 1956, a 15-month intensive promotional program primarily directed toward electric cooking was started. President Harold Quinton had this to say to his electrical allies when launching this program: "Whenever possible, Edison will use the Live Better . . . *Electrically* slogan in its advertising. We feel it is of immediate and long-range importance to our industry that people become conscious of this expression. Further, the phrase can provide a common theme which can tie all advertising together. Therefore, we urge that you include it in your own advertising whenever possible."

Although very early, there are already indications that the program has struck pay dirt. A sampling taken in the late spring of 1956 indicates a 12% saturation of electric ranges—a second poll taken in October 1956 indicated a rise to 13.9% saturation.

The Los Angeles Department of Water & Power and other local utilities are intensifying their promotional efforts as well. All utilities report great interest on the part of home builders, indicating that the potential owners do want to Live Better . . . *Electrically*.

The year 1956 saw an onslaught on the wiring bottleneck such as has never been seen before and with very significant results. The broad-gage Housepower program caught hold and resulted in a considerable upturn in rewiring jobs. In northern California, Pacific Gas and Electric Co. reports 28,561 Housepower entries up to Oct. 17; and that, of 9,871 new homes, 21% had 100-amp service compared with only 6.8% of the total in 1955.

Dozens of municipalities in the West have passed codes requiring 100-amp service to homes and in at least two areas, Spokane and Portland, 200-amp service is required.

Hawaiian Electric Co., after an outstanding program featuring seven special weekly newspaper editions with large cooperative ads by the home builders, electrical contractors, electrical distributors and dealers, financial organizations, and the Hawaiian Electric Co., reported that on July 1 they had already exceeded the 1956 yearly quota of rewiring jobs established in February.

Reprinted courtesy LET'S SEE Milwaukee magazine

Residential Load Growth

Well over a year ago, with an annual residential load of 2,650 kwh, Live Better . . . *Electrically* set its sights on average residential loads per meter of 4,500 kwh by the end of 1960. "Fantastic!" said some. "Unrealistic!" said others. "Much too low!" said still others in Oregon and Washington, for example, reveling in their present loads of 7,000 to 8,000 and even 12,500 kwh in some areas. And the confirmed proponent of Live Better . . . *Electrically* only smiled self-satisfactorily to himself as he thought of the all-electric home with many thousands already in use, and using 24 to 28,000 kwh per year.

Starting at the end of 1955, the month by month figures of 12-month use of electricity in homes show an increase from 202 to 232 at the end of August. (See Fig. 2.) A continuation

of this growth forecasts an acceleration of 50 kwh per year—by 1960 the yearly growth would total 450.

Fig. 1 shows increased residential use of electricity since 1930. The curve from 1955 to 1960 is the forecast of *Electrical World* based on past experience, which would indicate a usage in 1960 of 4,121 kwh. However, the accelerated growth indicated in Fig. 2 gives us the curve from 1955 to 1960, which predicts the exact objective of the Live Better . . . *Electrically* program—4,500 kwh in 1960.

The accelerated promotional programs of utilities and manufacturers, however, would seem to forecast that the 4,500-kwh figure would be outdistanced. The figures, which are ultimately reached in 1960, appear to be entirely up to the electrical industry itself.

What to Do About It

Our ultimate destination in kwh residential usage in 1960 is in our own hands. "Why should we do something about it?" "What should we do about it?"

The electrical industry receives a very small share of the consumers' dollar—2.75% in 1955. For the comfort, convenience and happier living offered by electricity, the average consumer spends no more than for tobacco or liquor.

How Much of the Pie?

Fig. 3 shows a dollar with that small piece of it that the electrical industry receives. An extra sliver has been added to show a small increase, readily achievable. In Fig. 4, this small sliver of an increase has been translated into understandable terms—"a bigger piece of pie." With this bigger piece of pie, it is easy to see that everyone can readily share without regard to competitors in our own industry. The competitors are really the other industries, the auto industry, furniture, liquor, vacations, etc.

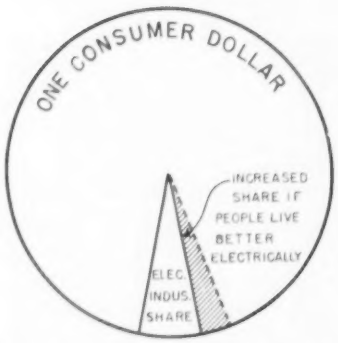


Fig. 3—The industry's share of the consumer's dollar, with an extra LBE sliver

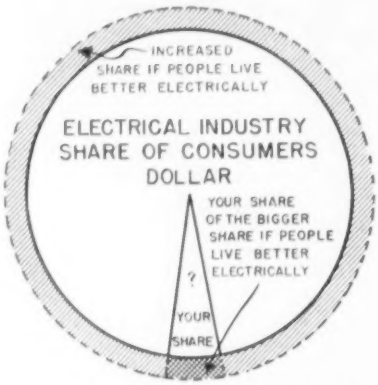

INCREASED SHARE IF PEOPLE LIVE BETTER ELECTRICALLY
ELECTRICAL INDUSTRY SHARE OF CONSUMERS DOLLAR
YOUR SHARE OF THE BIGGER SHARE IF PEOPLE LIVE BETTER ELECTRICALLY
?
YOUR SHARE

Fig. 4—Here is what the industry might receive as its share of a bigger piece of pie

Opportunity of the All-Electric Home

Tens of thousands of homes today are all-electric, with loads of approximately 10 times that of the average residential user today or 28,000 kwh per year. Fig. 5 shows what this electrical home means in terms of increased take. At current rates, the utilities would receive $560 per year compared with the very small amount of $72.73 in 1955. And the average home would enjoy $5,400 worth of electrical equipment instead of the $1,300 now in use.

The year 1956 was the turning point in a drive toward this bigger pie. More than 300 utilities have put their backs to the wheel. The momentum has been stepped up. The tempo of promotion is being heightened in 1957. More utilities are planning to spend more money. Many things are being done to make it easier for people to have and finance rewiring, to obtain the electrical appliances that all signs indicate they want to have to Live Better . . . *Electrically*. Road blocks are being removed.

The electric utilities have been the driving force behind this broad-scale promotion with a backdrop of national advertising provided by the Live Better . . .*Electrically*, Housepower and Adequate Wiring programs. What can others do to take advantage and capitalize on this great opportunity?

1. **Manufacturers** can use the Live Better . . . *Electrically* emblem and slogan in all of their magazine ads, in their TV and radio programs, and in their promotional pieces.

2. **Electrical distributors** can encourage their manufacturers and cooperate with their dealers to see that the emblem and slogan are used in all newspaper ads, in radio and TV advertising, and in all promotional display materials.

3. **Electrical dealers** should use the emblem and slogan in all newspaper ads, in radio and TV advertising, and in window and store displays.

4. **Electrical contractors** should organize to fill this pent-up demand, a need for the rewiring of 20,000,000 homes in the next 20 years at a cost of $5 billion.

5. **Labor organizations** should enlist and train the men needed to rewire these 20,000,000 homes, about 12,500 men would be continuously employed to do this job.

Yes, to Live Better . . . *Electrically* means something for everyone of us and it means that if people do Live Better . . . *Electrically* we will all Live Better.

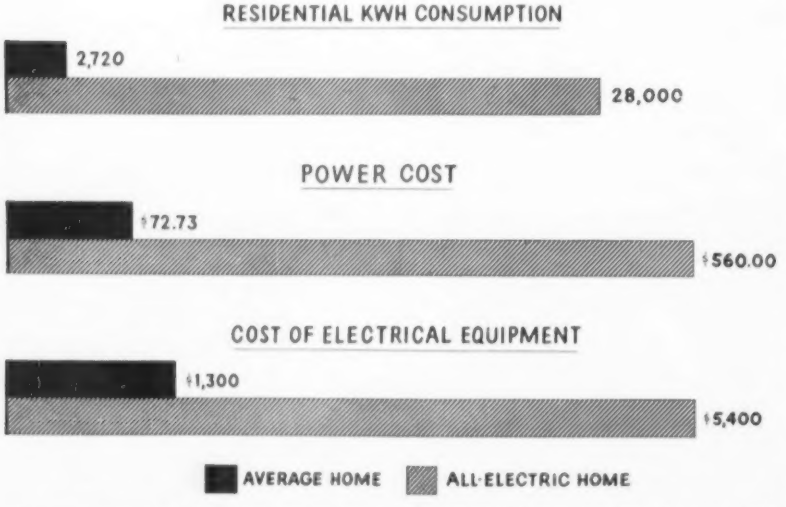


Fig. 5—Comparison of the average home with the all-electric home during the year 1955

THREE AT A TIME

San Diego Gas & Electric crews recently chalked up a first by reconductoring 20 miles of 115 kv in 19 days. They applied a technique used for many years with distribution circuits—pulling all three conductors at the same time. To do this the company purchased a three-reel Pengo tensioner and constructed a take-up device in the company shop. Using this special-purpose equipment they were able to pull 6,000 ft at a time.

The reconductoring was to increase the line capacity by changing 250 mcm copper to 636 mcm aluminum. In addition to increasing the conductor size, the insulation level was raised from 115 kv to 138 kv by adding disks to the suspension insulators.

Three Crews Handle Job

Three crews handled the job. One crew worked ahead of the others modifying the insulators and making any repairs or revisions to the structures. A crew with the take-up rig preceded the crew with the tensioner by about a mile. The copper was secured to the new conductor on one end and to the power-driven, take-up reels on the other. The crews were linked by radio communication. When General Foreman Johnny West gave the word, the three drums of the take-up rig began to pull in all three new aluminum conductors. The Pengo tensioner kept the lines taut and up off the ground. This speeded operations by doing away with the need for reel lagging to protect the conductor.

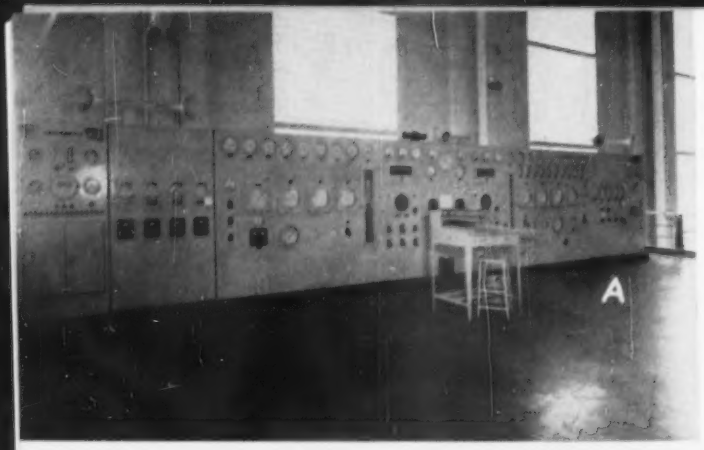
Sizable Savings

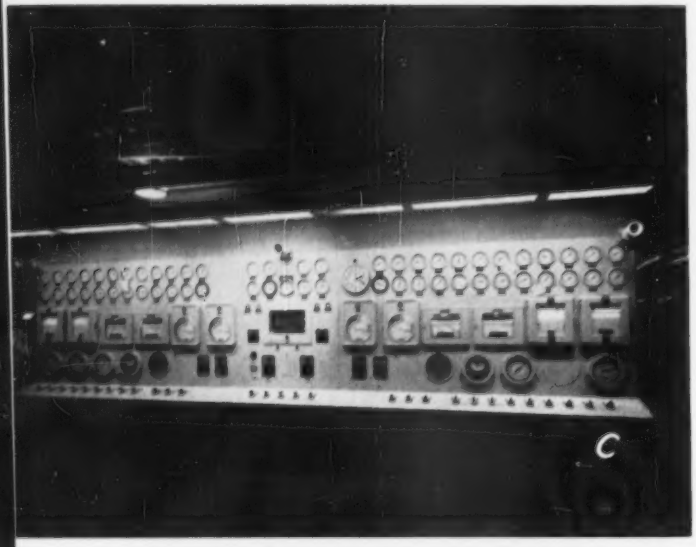
Was the three-at-a-time technique a winner? All of the time cards have been checked (and probably double checked) by the accounting department. They say that labor costs were 60% of normal. Automation paid off.

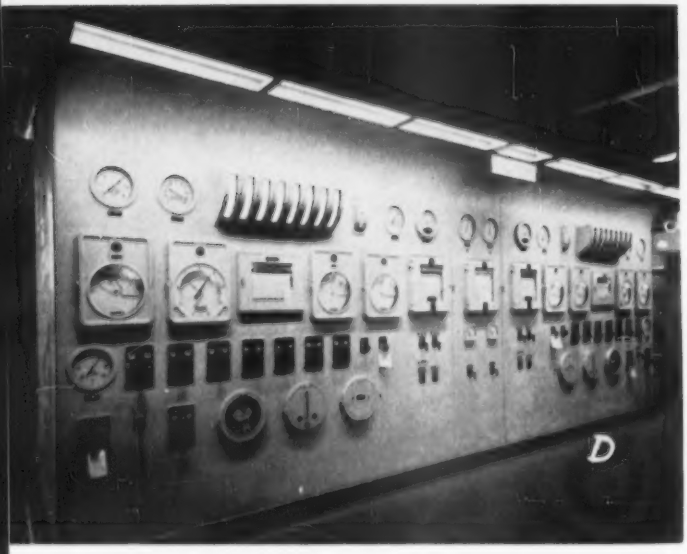
The significance of this now proven technique is that savings can be made with each new reconductoring job. From this point of view Johnny West's gang can be proud that they pulled three at a time.

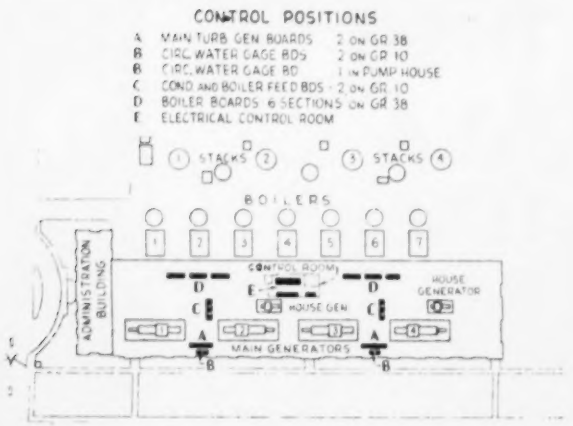
Fig. 1—The truck-mounted Pengo tensioner maintains sufficient drag while paying out to keep the conductor off the ground. The take-up rig is over a mile down the tower line

Fig. 2—The take-up rig pulls out the old copper and winds it onto the three reels. The hoist truck handles the reels and guides the lines. Radio control is from pickup (right)








CONTROL POSITIONS
A MAIN TURB GEN BOARDS 2 ON GR 38
B CIRC WATER GAGE BDS 2 ON GR 10
B CIRC WATER GAGE BD 1 IN PUMP HOUSE
C COND AND BOILER FEED BDS 2 ON GR 10
D BOILER BOARDS 6 SECTIONS ON GR 38
E ELECTRICAL CONTROL ROOM
STACKS
STACKS
BOILERS
ADMINISTRATION BUILDING
CONTROL ROOM
HOUSE GENERATOR
HOUSE GEN
MAIN GENERATORS

A—Original turbine gage boards 1 and 2. C—Feed water control boards and D—Combustion control boards with schematic diagram of the original locations (above). The information contained on these boards was centralized in the area of the electrical control as illustrated in the picture (right) and the diagram (below)

By C. O. Giles

Mechanical Engineer
Southern California Edison Co.

SCE Revamps Postwar Plant

- **Frees 35 trained operators**
- **Saves $200,000 annually**
- **Simplifies station operation**
- **Demonstrates . . .**

Centralized Control

WHEN Redondo plant No. 1 of the Southern California Edison Co. was dedicated in 1948, no one would have guessed that six years later plans would be under way to extend the controls to a central control room. The desire for better utilization of trained operators in the burgeoning Edison system focused attention on the modernization. The plan that evolved cost the Edison company approximately $1,050,000 and released about 35 operating personnel for reassignment to higher classifications in other new stations. The savings realized from the reduced staff will pay for the work in five years. These vast changes in the plant's nervous system were accomplished without impairing the capability or flexibility of the 288,000-kw plant. This is the story of increased automation in power generation.

Original Operation of Plant No. 1

Plant 1 of our Redondo steam station included four 72,000-kw turbine-generator units served by seven 400,000 lb/hr boilers fired either by natural gas or fuel oil. This plant was designed to carry wide load swings, automatically, through a 20-to-1 range for use in system regulation.

The automatic controls included pneumatic positioning devices actuated by pneumatic controllers mounted on local control boards situated as close as practicable to the controlled equipment. Sufficient indicating and recording instruments were also provided on those local boards to reflect station operation, enabling operating personnel to supervise the automatic operation from those boards and to resort to remote-manual operation of the equipment

ol Pays at Redondo

during unusual or emergency conditions in the station.

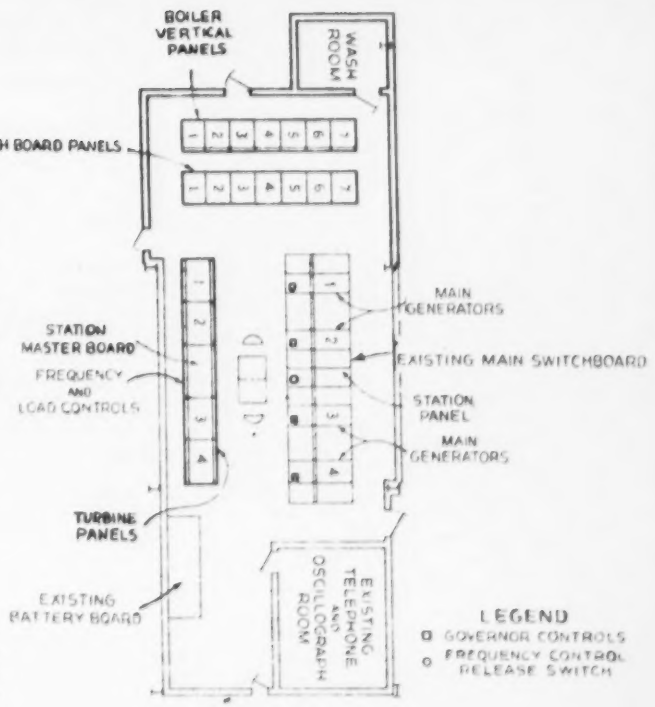
The control boards included seven combustion control boards distributed along a firing aisle serving the seven boilers; four turbine gage boards at two different locations on the turbine deck; four condensate and boiler feed boards at two different locations in the vicinity of the pumps; and two circulating water gage boards.

The original station design provided a centrally located electrical control room that contained the electrical switchboards for the main generators, the switchboard for battery control and direct-current distribution, and the telephone and oscillograph equipment.

Excluding watch engineers, the staff of operating personnel required for each shift amounted to about 15.

How Centralization Was Accomplished

The original electrical control room was extended and remodeled to become the central control room. The modifications included the removal of the reinforced concrete north wall and washroom, their relocation to the north, the



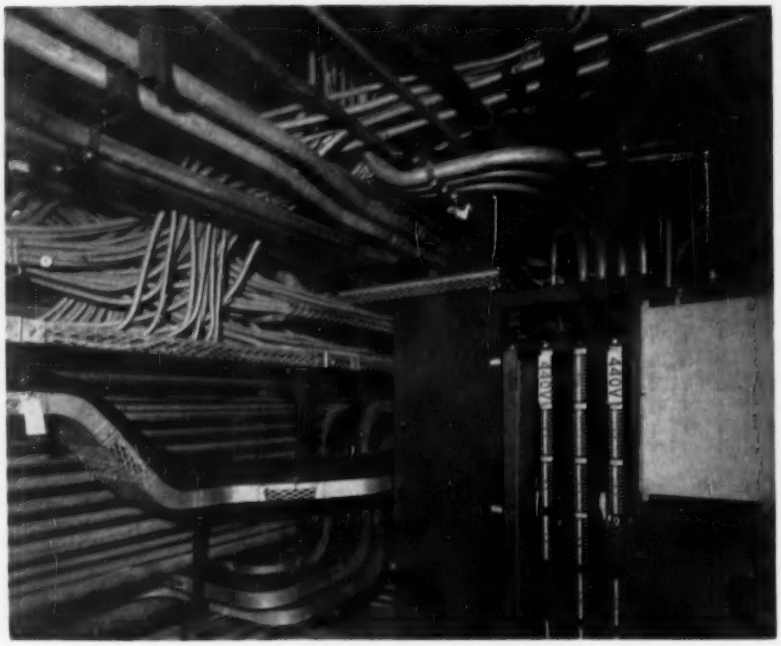
relocation of a lighting switchboard and two small motor generator sets, and the installation of a new enlarged ventilation system and modernized lighting fixtures.

The orientation of the control panels in the modified control room are shown in the figure, p 85, of the remodeled control room. To the left are individual turbine panels—each containing all of the essential instruments and controls for the turbine, the circulating water system, and the condensate and feed water systems for one unit. Corresponding generator panels are on the right. The station master panel is located in the center of the turbine panel group and includes the master controls for the seven boilers, motor control switches for common station facilities, and appropriate instruments and annunciators.

The individual control panels for the seven boilers can be observed between the turbine and generator panels. The panels for each boiler consist of a console containing controls and supervisory instruments and a detached vertical panel on which are mounted standard-size recorders, television receivers for burner and drum-level viewing, and annunciator panels. Miniature transfer panels and console instruments were utilized in order to provide all necessary instruments for each boiler in the console space available.

The centralized control panel retained the local control boards as relay boards and important instrument measurements provided on these boards have been transmitted either pneumatically or electrically to the new panels in the central control room. The original control systems have remained essentially unchanged in that automatic control is still accomplished by the original control devices mounted in the local control boards. In no case were control lines looped in and out of the central control room. Instead, pneumatically actuated valves were installed to permit remote-manual control from the central control room to be substituted for the local automatic control. On certain controls, provisions were made so the automatic controls could be remotely biased from the central control room.

Certain instruments and controls were not considered necessary in the central control room, so they were omitted. These included the boiler cleaning lance controls fuel oil pump sequence selectors, generator hydrogen controls, turbine lube oil temperature controls, feed water bias controls and evaporator controls. This equipment is operated by three roving operators assigned to the general station and directed from the central control room.



The photo shows a conduit gallery beneath the central control room with new cable runs in the foreground and new armortube in the upper left background after installation

Abnormal conditions in this equipment, of course, are annunciated in the central control room.

Routing the vast number of electrical cables and pneumatic tubing into the control room was sometimes a problem. More than 600 instrument air lines and 400 separate electrical circuits were brought into the central control room. Armored tube bundles of ¼-in. tubing were utilized for the instrument air lines and worked out very satisfactorily for this type of installation. The tube bundles and electrical cables were routed through the existing cable gallery below the central control room, and although there were some rather congested areas, no major alterations of the gallery were necessary.

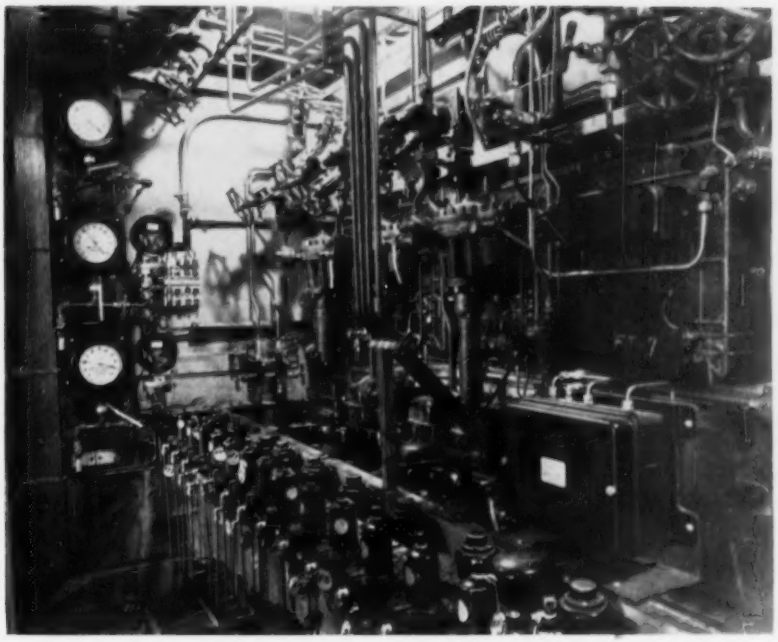
Thus, with the important instrument measurements on the new panels for supervision of operation and, with means for selecting either manual or automatic control and for remotely adjusting the automatic controls, the control room operator now performs all the essential duties previously accomplished at the local boards.

Additional Features

To simplify operations from the central control room, the following features were added, over and above original plant instrumentation.

Television monitoring of drum level replaced one sight duct on each boiler. Television viewing of the six burners on each boiler was also added to give the control room operator a picture of flame pattern during operation and to provide him with visual knowledge of burner behavior during remote ignition or quick fuel change-over from gas to oil firing. The 14 television receivers are mounted on the seven boiler vertical boards and the operator can, with a sweep of the eyes across the seven boards, swiftly check drum levels on all seven boilers. Similarly, with a glance at the burner viewing television receivers, he can readily detect irregularities in flame patterns in any of the boilers and knows immediately which boilers are burning natural gas and which ones are burning fuel oil.

Natural gas fuel is burned in the boilers to the extent of its availability and is supplemented or replaced entirely with fuel oil as required—usually upon very short notice. At Redondo station where natural gas is nearly 100% interruptible, facilities must be provided to accomplish a rapid, safe change-over from natural gas fuel to oil fuel. Any one of the seven boilers in Redondo Plant 1 may require changes in fuel three or four times a day during certain seasons of the year. Originally this operation was accomplished at the local combustion control boards and by the manipulation of valving at the burner front. Now, special remote-controlled devices have been provided to facilitate the substitution of oil fuel burning direct from the central control room. When burning gas, the fuel oil system is main-



An inside view of combustion control boards 1 and 2 showing a battery of trapping valves in the foreground and some new transmitters and pressure switches in the background

tained on a stand-by basis, ready for instant change-over. The fuel change control transfer valve provided on each boiler bench board is a panel loader, the output of which positions the necessary four valves in proper sequence. This panel loader has a clutch assembly that is interlocked with the ignitors such that it can be manipulated only when the ignitors are on.

Under original design, each ignitor was operated at the boiler front by turning the control handle on the head of the ignitor itself. With centralization, the ignitors for all six burners of each boiler are arranged to be operated simultaneously and remotely by the ignition sequence control switch mounted on the boiler bench board in the central control room. This switch provides for the initial air purging of the ignitors with spark on, followed by the shutting off of air and the admission of gas to the ignitor, and finally the position for gas on and spark off.

Automatic bearing temperature scanning systems are provided. The monitors are mounted on the rear of the boiler vertical boards and high temperature alarm contacts therein are connected to the annunciator panel on the master control board. When there is high temperature annunciation on this panel, the operator refers to the monitor for follow-up on point identification and amount of temperature deviation. Bearings of the following equipment are monitored: main turbine-generators, house turbine-generators, forced- and induced-draft fans, boiler feed pumps and condensate booster pumps. Since this equipment was not supplied with provisions for bearing thermocouples, it was necessary to work out various arrangements to obtain representative bearing temperatures. Copper-constantan thermocouples were made up to order on the job to suit the requirements of the individual pieces of equipment.

Automatic temperature control systems were installed for turbine lube oil and condensate to replace the earlier practice of manual valving at the lube oil and condensate coolers. The controls are mounted locally, near the respective cooler, and the controlled temperature of condensate and turbine lube oil for each unit is recorded in the central control room. The control device in each system is an air-operated butterfly valve installed in the cooler by-pass line and positioned by a single element temperature controller sensing fluid temperature out of the cooler.

Plant Operation During Conversion

Plant 1, with a capability of 288,000 kw, is our largest steam-generating plant available for wide range regulation and is utilized almost daily for off-peak regulation. During the final three months of conversion work, when our hydroelectric units were operating at full capacity to take advantage of an unusually good stream runoff, it was very important that plant No. 1 be available almost constantly for regulating purposes.

Certain phases of conversion work required short outages of turbines, boilers or their auxiliaries; and it became necessary to coordinate the activities of the construction and test forces very closely with the operating program of the station personnel. The completion of this conversion work without mishap and with a minimum curtailment of plant generation was the result of careful planning and coordination of the Stone & Webster Engineering Corp. and the operating personnel of the Redondo steam station.

Operators Retrained

As the physical changes were made at the plant, plant engineers and foremen were active preparing texts and drawings of the new control setup. The new manuals contained material on steam generators, turbines and the many auxiliaries that go to make a steam station. Copies of the new manuals were distributed among the operators and classes were conducted on a lecture and on-the-job basis for three months. The value of the training activities was demonstrated by a marked absence of unforeseen difficulties.

This job is a dynamic statement of the fact that in the electrical business keeping up means looking 10 years ahead and rebuilding 10-year-old stations—just to keep up.

Edison Company Expansion Program

This Redondo No. 1 modernization was undertaken in the face of a program of expansion that will give the Edison company 1,500,000 kw of capability of new steam generation in the years 1956 through 1959. The proportion of this expansion is best silhouetted against the 1956 system peak—2,504,000 kw.

Date and Plant	Kw
1956	
Aug., El Segundo Unit 1	175,000
Sept., Alamitos Unit 1	175,000
1957	
April, Alamitos Unit 2	175,000
July, Redondo 2, Unit 6	175,000
1958	
June, Huntington Beach Unit 1	200,000
Dec., Huntington Beach Unit 2	200,000
1959	
March, Mandalay Unit 1	200,000
Sept., Mandalay Unit 2	200,000

Demand for
- **Low cost**
- **Increased Safety**
- **Improved appearance**

Brings . . .

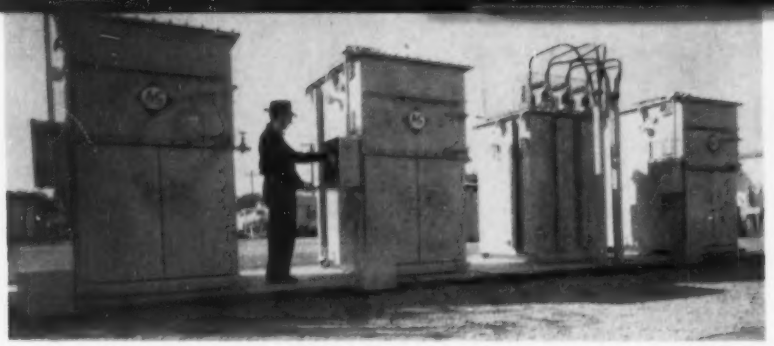


Fig. 1—Improved appearance and greater safety are contrasted with three regulators of new design and one with cover bushings. New units have bushings below the mechanism

New Wrinkles in Regulators

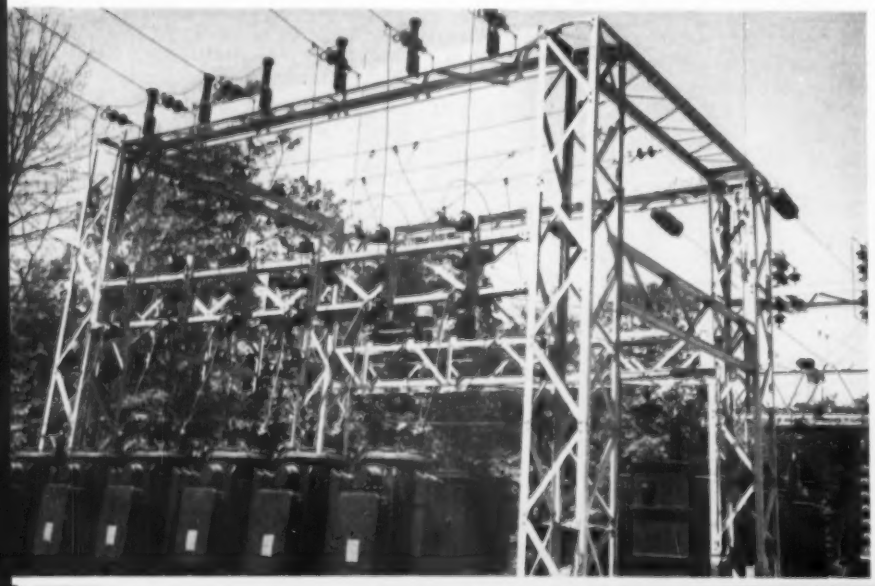
In recent months, manufacturers' literature has been agog with new wrinkles in distribution regulators. Lower cost and increased utility of this class of regulators has caused many users to revise their standards and reserve station regulators for applications where special requirements such as increased safety or appearance justify the more costly station-type unit.

The greatly decreased cost of regulation that can be achieved through the use of the distribution regulator (built like a distribution transformer in a round tank) over that of a station regulator (built like a power transformer) is the most important trend. Larger sizes are now available. This made it possible to regulate feeders of 3,000 kva or greater. Savings range from 25-50%.

Much hubba hubba has been expended on a new feature of these regulators which makes it possible to trade increased kva of regulation for decreased range. In general a 10% regulator operated at 5% regulation can be operated at 160% of kva capacity. Here again savings are possible if the system lends itself to narrow-band regulation. The real virtue of this feature is flexibility.

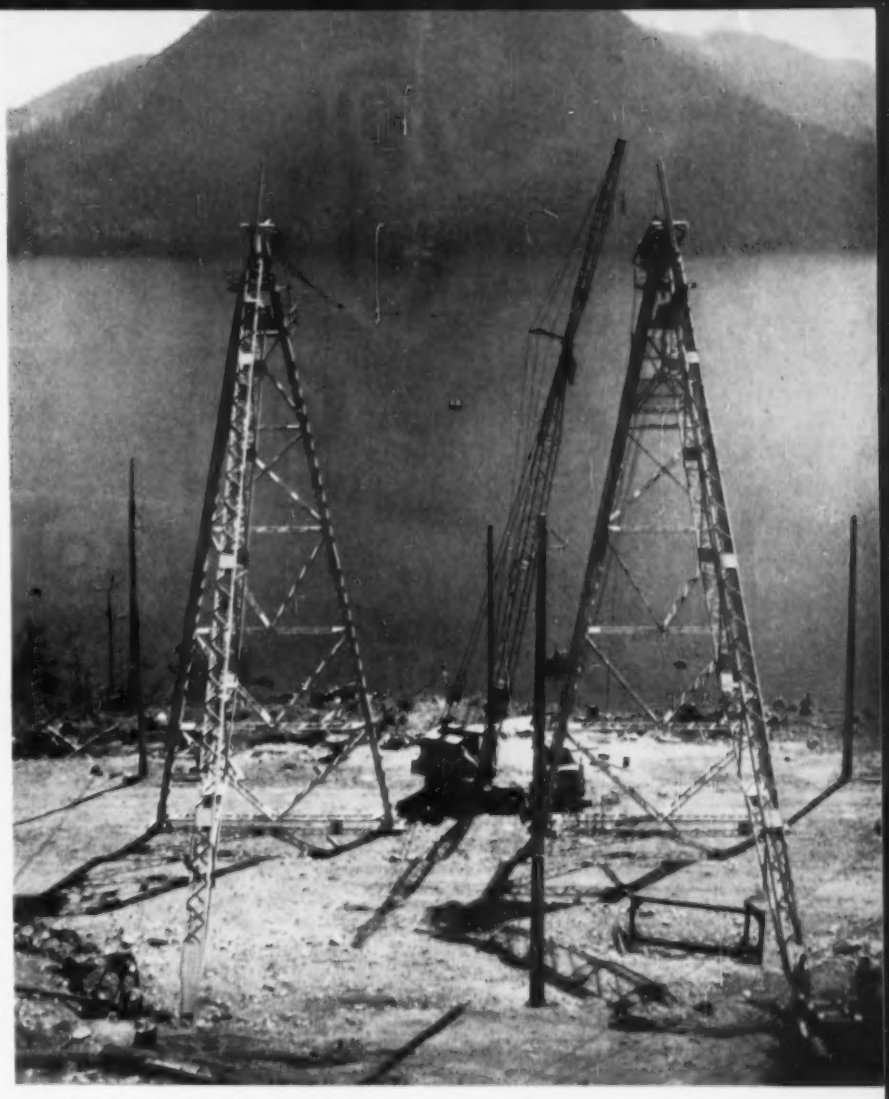
Fig. 2—Station space limitations made it extremely desirable to have underground construction with metal-clad by-pass and disconnect switch, which avoided safety hazard resulting from school children passing to and from school on the outside of metal frame

Fig. 3—The trend away from station-type regulators is shown in this station where six distribution-type regulators are used to give feeder regulation on two feeder circuits



Station regulators, hurt by the trend to distribution-type equipment, have become more attractive for applications in residential stations where safety problems and appearance will more than justify the increased cost. Recent modifications in these regulators have enabled users to do away with unsightly and unsafe overhead by-pass and disconnect switches as well as the cover bushings. Without any live parts exposed, this equipment becomes as good a neighbor as metal-clad switchgear. In the PG and E station (Fig. 2), this design enabled engineers to use a part of the station which would have been lost. Using conventional equipment open 12-kv parts would be within a few feet of the fence separating the station from a residential walkway. Much credit is due the manufacturers and utilities who bring about these changes.

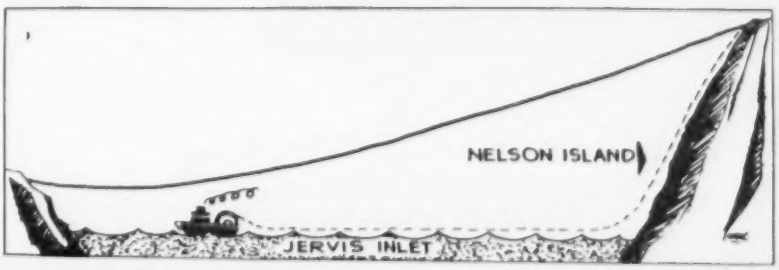
Two-Mile Jump



The world's fourth longest overhead shore-to-shore transmission line has been completed in British Columbia by B. C. Electric Co., as part of its new 138-kv, 100-mile link from Vancouver to the pulp and paper town of Powell River. The picture (left) looks past two of the three 90-ft towers on the mainland toward Nelson Island. The 45-ft Nelson Island towers are located at 1,600-ft elevation.

The stringing operation is illustrated in the sketch below. The conductor was secured to the Nelson Island towers and paid out across the inlet. Barges and scows were used as cable supports while the line was carried across the inlet. On the mainland side, the conductor was taken up by a 25-ton winch. The cable clearance over the water was about 200 ft and is marked with 2-ft orange spheres to warn aircraft. The conductor weighs 54 tons. It is 1¼-in. ACSR with a minimum breaking strength of 260,000 psi. The main conductor strands are socketed and prestretched under a tension of 115,000 psi. It was necessary for British Ropes Ltd. to expand their Vancouver factory to include a prestressing facility to meet the requirements for this cable.

Completion of the 10,100-ft Jervis inlet and crossing and a second 6,500-ft crossing of the Agamemnon channel finishes the $3,000,000 line. The rugged 100-mile line was first energized on Oct. 1.



New G-E load center with 70-amp main breaker saves 19%, bridges gap between 50-amp and 100-amp needs

Single-phase, 3-wire, grounded neutral, 120/240 volts a-c

LIVE BETTER ELECTRICALLY

New wired-in 70-amp main breaker eliminates need for separate main disconnect.

Now you do not have to jump to a 100-amp box—at much greater cost—when a 50-amp box proves too small. Instead, you can install this new G-E meter socket-load center with a wired-in 70-amp main circuit breaker at a *19 per cent price saving* under the 100-amp box!

Up to 14 single-pole branches permit plenty of 2-pole circuits.

The new load center has 14 branch circuits, with space to spare for double-pole breakers to feed electric ranges, dryers and other 240-volt appliances. It has been tested and approved by the Department of Building & Safety, Los Angeles, California.

Progress Is Our Most Important Product

GENERAL ELECTRIC

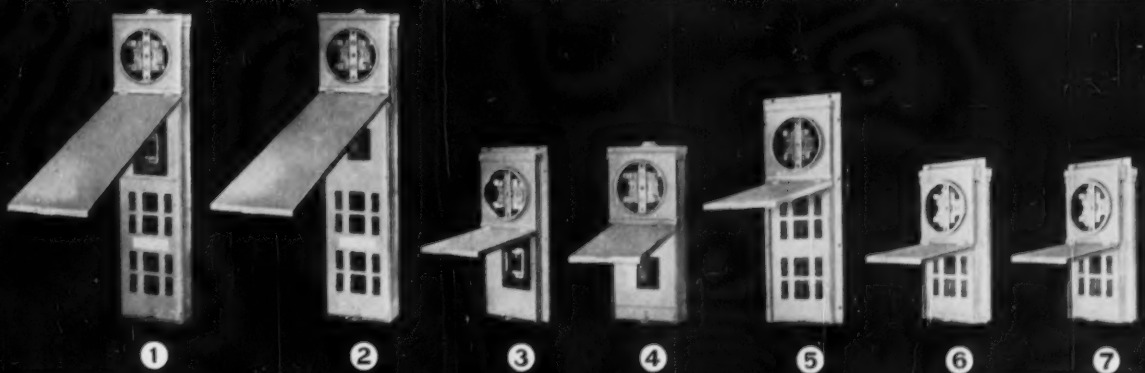
NOW—a full line of meter socket-load centers from General Electric to give contractors a choice for every need through 100 amperes

Each of these seven new General Electric load centers is available in semi-flush or surface mounting. Interchangeable raintight conduit hubs, straight-in, no-loop wiring and plenty of working room simplify installation, lower costs. Main breakers and main fuse pullers come already wired in. See your nearby G-E Distributor (listed on next page) for complete application and pricing information. *Circuit Protective Devices Department, General Electric Company, Plainville, Connecticut.*

1. **100-amp load center,** Has fuse puller for main disconnect; 16 branch circuits, including 4 double-pole branches for 240-volt appliances. Cat. No. TRF116FR2 for semiflush mounting; Cat. No. TRF116R2 for surface mounting.
2. **100-amp load center.** Uses wired-in 2-pole E frame circuit breaker for main disconnect; 16 branch circuits, including 4 double-pole branches. Cat. No. TRM116FR2 for semiflush mounting; Cat. No. TRM116R2 for surface mounting.
3. **100-amp main fuse puller disconnect** with double load lugs for subfeeding to separate panels or to the new G-E kitchen center. Cat. No. TRF37F for semiflush mounting; Cat. No. TRF37R2 for surface mounting.
4. **100-amp main disconnect** with 2-pole E frame circuit breaker. Like all G-E raintight devices, box is galvannealed steel, Bonderite* treated to resist weathering. Cat. No. TRM100F for semiflush mounting; Cat. No. TRM100R2 for surface mounting.
5. **70-amp load center.** New G-E 70-amp main breaker is wired in; 14 branch circuits. Cat. No. TRM714FR2 for semiflush mounting; Cat. No. TRM714R2 for surface mounting.
6. **70-amp load center** with 2 double-pole and 4 single-pole circuits, lugs in mains. For use where a single main disconnect is not required. Cat. No. TRQ78F for semiflush mounting; Cat. No. TRQ78R2 for surface mounting.
7. **50-amp load center** with 6 branch circuits. Uses wired-in 50-amp 2-pole common-trip circuit breaker for main disconnect. Cat. No. TRM56F for semiflush mounting; Cat. No. TRM56R2 for surface mounting.

**Parker Rust Proof Co.*

This new line of G-E meter socket-load centers is now in stock!



You can order these seven new meter socket-load centers from the G-E Distributors listed on the following page

The new line of G-E meter socket-load centers shown on the preceding pages can be ordered from these General Electric Distributors in California. See your G-E Distributor today for complete pricing and application data. He can give you *fast delivery.*

Alameda
W. Stone Company

Bakersfield
Stewart Electric Supply Co.

Burbank
Coast Wholesale Electric Co.

Culver City
The Lodestar Corporation

Downey
Electrical Distributors, Inc.

Emeryville
General Electric Supply Company

Fresno
General Electric Supply Co.
Graybar Electric Company

Harbor City
Superior Wholesale Electric Co., Inc.

Irvington
Fremont Electric Supply Company

Lawndale
Southern Wholesale Electric, Inc.

Long Beach
Gaines Electric Supply Co.
General Electric Supply Company
Graybar Electric Co., Inc.
Parks and Company

Los Angeles
Associated Wholesale Elec. Co.
California Wholesale Elec. Co.
Certified Wholesale Electric, Inc.
Degen-Fiege Company
Electrical Contractors Supply Co.
General Electric Supply Co.
Gough Industries, Inc.
Graham-Reynolds Electric Co., Inc.
Graybar Electric Co., Inc.
Hollywood Wholesale Electric Co.
Industrial Wholesale Electric Co.
The H. G. Rising, Inc.

Modesto
Wille Electric Supply Co.

North Hollywood
Heitzer Wholesale Electric

Oakland
Gilson Supply Company
Graybar Electric Co., Inc.
Parker Electric Co.
State Electric Supply, Inc.

Pasadena
Cook-Nichols Co.

Redding
Gerlinger Steel & Supply Co.

Redwood City
Koblick Supply Co.

Sacramento
General Electric Supply Co.
Graybar Electric Co., Inc.

San Bernardino
General Electric Supply Co.
Graybar Electric Co., Inc.

San Carlos
Savasta Electric Supply Co.

San Diego
General Electric Supply Co.
Graybar Electric Co., Inc.
Pacific Wholesale Electric Co.
Western Metal Supply Co.

San Francisco
California Electric Supply Co.
General Electric Supply Co.
Graybar Electric Co., Inc.
Grey Electric Supply Co.
Maltby Electric Supply Co.

Santa Ana
Orange County Wholesale Electric Co.

Santa Barbara
Raber Supply Company, Inc.

Santa Rosa
Leete Electric Motor Co.

Stockton
General Electric Supply Co.

Van Nuys
Andrews Wholesale Electric

For top quality load centers see your G-E Distributor today!

GENERAL ELECTRIC

CIRCUIT PROTECTIVE DEVICES DEPARTMENT, PLAINVILLE, CONNECTICUT

ELECTRICAL WEST Contractors' News Letter

QUICK NEWS ON TRENDS, LAWS, CODES, MATERIALS, EQUIPMENT, COSTS, WAGES, ETC.

Fine prospects

At ground level, where most construction work begins, 1957 should be a pretty good year. Already started by the time this reaches you, weather only may delay the starting of some of the numerous projects that have been on the boards of engineers and architects during the past several months.

Higher costs

Costs will be higher, though. A number of wage scales go up Jan. 1 or Feb 1 from previously negotiated agreements. Material prices haven't stopped rising, either. All switch and circuit breaker equipment was being raised and manufacturers reverting to traditional discounts. Although copper remained reasonably steady, it is manufacturing labor rather than metal that is pushing up under prices.

Statistic

The big figures on the Western outlook will be found in this month's feature article. Likewise, an idea of the promotional help to the market planned by the utility companies is given in the review by their sales departments. All of this brings work to contractors.

Inspectors organize

A uniform interpretations committee has been crystallized out of informal meetings of the electrical inspectors of Santa Clara County. The chairman is Al Rotholtz, Santa Clara County chief inspector; vice-chairman is Don Harris; and secretary-treasurer is Mervin Tollefson. The idea is to develop uniform interpretations of the codes and to publicize these to the electrical industry by means of bulletins, diagrams or meetings. These will be distributed to inspectors, contractors, building departments, electrical union, utilities and others interested. Regular members include the chief inspector of each municipality and county, a representative from Local 332, IBEW, one from the utilities, and one from the code committee of the Santa Clara-San Benito Chapter, NECA. Meetings will be held the third Thursday of each month.

Loan to build

The International Brotherhood of Electrical Workers has been certified by FHA as eligible to buy mortgage loans insured under FHA programs. Union welfare and pension funds will be invested in FHA mortgages. . . . Another step taken by FHA was to raise the mortgage rate to 5%. On multifamily mortgage homes it will be increased ¼% to 4½%. The action is expected to free more mortgage money for home building.

First thousand

The 1,000th adequate wiring certificate was awarded by Electric Club of Washington in a special ceremony last month. It was presented to Chester Westling, general manager of the Kay Corp., a home building firm, by Al O'Brien, president of the Electric Club.

Isles lose color

John Thomas Carey, as colorful a character as the Hawaiian Islands in which he was the chief electrical inspector of Honolulu, died Nov. 30, aged 66, during an operation. Always outspoken, Mr. Carey made himself heard at section meetings of the International Association of Electrical Inspectors across the United States. He founded the Hawaiian Chapter and was twice its chairman. He carried on a frustrating campaign to bring the Southwestern Section's annual meeting to Honolulu.

Honor to a worker

Charlie Coleman retired after nearly 30 years as the adequate wiring salesman for Utah Power & Light Co., Dec. 1. Famous for his barbecue cooking at IAEI inspector doings, the Utah inspectors honored him at its Dec. 10 meeting, presenting him with a watch. Harold S. Morr, Northwest Section president, made the presentation. The event was hosted by G-E Supply.

Legal mills

As state legislatures reconvene in January, laws may be introduced affecting contractors. In Utah, another effort will be made to introduce a state electrical inspection law. The bill passed last year by both houses but vetoed by Governor Lee may be reintroduced by the Intermountain Electrical Assn. Ad Woolley replaces Floyd Shipp as chairman of the legislative committee.

Another tack

Another Utah action may become important. The Utah Construction Industry Council has engaged an attorney to draw legislation that would repeal and replace sections of the contractor licensing law and strengthen it.

Ordinance changing

Lots of new ordinance activity going on in the Mountain states. Emmett, Idaho, recently passed a new electrical ordinance. Ogden, Utah, has a new electrical ordinance requiring licensing only after examination of journeymen. Provo and Orem are said to be working on new ordinances that probably will require No. 6 wire minimum for dryer circuits.

Keep pace

Union membership increased 4% in California between July 1955 and 1956, compared to a 6% increase in nonagricultural employment in the state. Membership represents 50% of all nonagricultural employees in the San Francisco-Oakland metropolitan area and 36% in the Los Angeles-Long Beach area. In the state as a whole, it is approximately 40%.

Laws to anticipate

California Legislature will probably have introduced bills for bonding of subcontractors, prohibition against misleading advertising, bankruptcy of contractors, waivers of examination, active and inactive contractors, abiding by contracts, requirement of evidence of contractors license, scope of A and B licenses, architectural practice act, revision of lien laws, bonding of all private as well as public works and the subbidders listing law. The Construction Industry Legislative Council is making a study of all for the benefit of respective industry associations.

How to run jobs

A job management course will begin this month at San Jose Junior College, sponsored by the Santa Clara-San Benito Chapter of NECA, according to George Harter, manager. It will run 20 weeks, one night a week . . . Northern California Chapter, in Oakland, recently completed such a course and held a graduation dinner early in December.

1957 staff

New officers were elected by the Santa Clara-San Benito Chapter Dec. 8. James Sardella is governor, Paul Leslie president, Calvin Young vice-president, and Leon Haze secretary-treasurer.

New group takes over

Officers were also elected by the Northern California Chapter, NECA, at a Dec. 3 meeting of the board of directors. A. P. Maser succeeded Harold Pierce as president. Maser is proprietor of Thompson Electric Co., Walnut Creek. Jack Ellis of Vallejo was named vice-president, R. W. Beard, Scott-Buttner Electric Co., Oakland, was named governor to succeed Edgar Buttner of the same firm. Walter D. Vance Jr. of California Electric Co. was named treasurer. W. A. Cyr, honorary member, who had held the treasurer post since the days when he was its voluntary secretary, was named honorary lifetime member. Branch chairmen of the chapter are: Alameda County Branch, George Curran, Red Top Electric Co., Oakland; Contra Costa County Branch, C. L. Brunelle, Concord Electric Shop; Solano-Napa Counties Branch, Harold Pierce, Ed. Pierce Electric Co., Vallejo.

Hitch up band wagon

High time for National Electrical Week activity to be starting. Only a month away now, Electric Week is the week of Thomas Edison's birthday, Feb. 10-16. Nationally, a lot will be done to promote it over TV, radio, magazine and newspaper ads. Identify yourself with it locally by initiating or participating in some local celebration. Your power company has lots of display material and helps, or can get it.

New ties

National Adequate Wiring Conference, the 13th annual one, will be at Sherman Hotel, Chicago, Feb. 21-22. Its aim is to develop more ways to promote and sell more wiring in order to provide more Housepower in more homes, so that more homeowners can live better electrically. If they do, more electrical contractors can live better from electricity.

OHI

Tucson, Ariz., will hold a big national Operation Home Improvement congress Feb. 1 and 2. It is expected to draw prominent speakers and people from all over the United States. Future plans call for a national "Better Your Living" month promotion in May. Our job in this industry is to make that bettering electrically.

Getting results

Results of the financing plan first initiated by Cincinnati Gas & Electric Co. were recently reported. In October, the third anniversary of the company's wire-on-time plan reports showed an increase in jobs accepted from the first year's 781 to 1,088 the second year, and 1,619 the third year. The dollar value arose from $191,707 the first year to $539,489 the third year, with an average cost increase from $245 the first year to $333 the third year. A total of 480 contractors are participating.

Store buyer approach

A store lighting clinic will be the main feature of the Western Winter Market in the Western Merchandise Mart during Market Week, Feb. 4 through 8. It will be sponsored by Northern California Electrical Bureau, Pacific Gas and Electric Co. and the Mart in Space 490 on the fourth floor. The clinic will be a practical demonstration of the proper use of light to attract business, to enhance the appearance of merchandise, and to create a buying atmosphere. Three revolving stages with identical displays of furniture, carpets, draperies and giftwares will show comparison of standard and de luxe cool and warm white fluorescent lamps with incandescent sources. Also demonstrated will be the luminous background as a means of combating daytime window reflections. The promotion ties in with the Certified Lighting program of the bureau as one means of publicizing its availability to store owners.

Young ideas

Home builders, at their convention in Chicago, Jan. 20-24, will be given a pitch on electrified homes by the magazine "Living for Young Homemakers." A community of 23 scale model homes, christened Electri-Living Town, U. S. A., will feature at least 200-amp service entrance, low-voltage wiring for switching, electric kitchens featuring built-in cook tops, etc., and some will have heat pump and electric heating systems.

S. F. next

Western Plant Maintenance and Engineering Show will move to San Francisco Civic Auditorium this year, June 11-13. This Clapp & Poliak show was held in Los Angeles in 1955. A conference will be held concurrently under L. C. Morrow, consulting editor of "Factory Management and Maintenance."

Change guard

Puget Sound Chapter, IAEI, elected Fay Hudson of Bellevue as chairman at its annual meeting Dec. 1. Dean Smyth was named vice-chairman, Megler Girard succeeded Clare Alger who has been secretary for a number of years but asked to be relieved. Officers were installed by R. J. Larrabee, Underwriters' Laboratories. P. L. Disney is the retiring chairman.

New slate

Another long-time secretary, E. V. Muller of the California Division of Industrial Safety, resigned as secretary-treasurer of the Southern California Chapter, IAEI. At the annual meeting Nov. 7, held at Disneyland Motel, A. J. "Tony" Hund of Anaheim was named chairman, S. G. Marrocco of Riverside vice-chairman, and Charles Metzger of Long Beach was named secretary-treasurer to succeed Muller. Meeting dates for 1957 were set. The Jan. 23 meeting will be at Pasadena, March 27 at San Diego, May 22 at Long Beach, July 24 Santa Barbara, Sept. 25 at Anaheim.

Metal code

Tucson is working on a new electrical code. It is expected to be submitted within the next two months. A return to a metallic system and elimination of nonmetallic sheathed cable is being aimed at.

Help with ordinances

A code advisory committee has been set up by the Arizona Chapter, IAEI, to confer with cities and towns and counties in regard to code problems, writing or revising codes and ordinances for adoption. The advisory membership is composed of members of AIA, AIEE, IAEI, utilities, manufacturers' agents and distributors. Each group is to be asked to appoint a member and alternate.

Sights set ahead

The year's programs in advance have been announced by the San Jose Chapter, Illuminating Engineering Society. The Jan. 16 meeting will have a program on new lamp developments; Feb. 20, modern industrial lighting with a tour of the Ford plant at Milpitas; March 20, commercial building floodlighting with a demonstration; April 22, tour of Stanford University illumination laboratories and school plant planning facilities; May 15, home and garden lighting, with a field trip to a display home lighted by the chapter committee; June 19, store lighting, with a field trip to the new Emporium, San Jose; and Sept. 18, stage lighting, with a field trip to the Holy Cross High School at Mountain View.

Joint effort

Electrical Inspectors' Assn. of British Columbia was debating whether it should participate in celebration of the National Electrical Week of the United States. After consideration it decided to do so and appointed a committee to work on it. It also decided to hold a joint meeting with the Puget Sound Chapter, IAEI, at Bellingham.

Develop an area

Coverage of the entire area of Utah-Idaho Chapter, NECA, has been made by the new manager, A. R. Woolley, in an earnest effort to develop policies and a program acceptable to a larger number of the contractors in the two states. A questionnaire was sent to members and is being studied by the executive group. The directors held a meeting Dec. 3 in Pocatello at which the idea of having a joint industry board with IBEW was considered.

Return to office

Los Angeles Chapter, NECA, for the first time in its history re-elected its entire board of directors and returned its officers to new one-year terms: President Andrew L. Hannon, Hannon Engineering Inc.; vice-president is A. L. Berg, Berg Electric Corp.; treasurer is J. B. Shamel, California Electric Construction Co.; and Charles A. Wikle of A. S. Schulman Electric Co. is governor. Warren Penn, executive vice-president, returned from a European tour before Christmas and in time for moving the offices to the new two-story building at 24th and Broadway, just being completed.

Decision to be made

Reorganization meeting of the California-Nevada Conference of NECA Chapters will be held at Hacienda Motel, Fresno, Jan. 11 and 12 under the new district vice-president, Rollie Goold of Stockton. Decision whether to continue the conference or to operate as a district will be made at the time.

More ulcers

Contractor employers need more health and welfare than their electricians do, according to experience in the San Francisco Bay area. Having established health and welfare for the electricians, the employers set up a similar program of their own with California Physicians Service. However, claims have been heavy and rates, paid for by the employers themselves, will have to go up, they were told.

Names in news

Among people, had you heard that William C. White has been transferred from the Salt Lake City house of Graybar to San Francisco as inside construction sales manager . . . That Oscar Meisner has been promoted to assistant director of the bureau of street lighting for Los Angeles . . . That Old-timer David Mahoney, San Francisco electrical contractor, died early in November. He will be succeeded on the San Francisco Electrical Contractors Assn.'s board of directors by John F. Bauer of Fishback & Moore . . . NuTone's representative, Floyd Marple, has moved to 237 W. 30th St., Los Angeles . . . That Jerry Collins of Portland General Electric Co., manager of commercial sales, has been named president of the Electric Club of Oregon . . . That William Walters, sales manager of Sierra Electric Corp., was named vice-chairman of the wiring device section of NEMA.

Stock near

I-T-E Circuit Breaker Co. has established a warehouse in Los Angeles, Bill L'Hommedieu has announced. All standard circuit breakers and other demand items of the line will be stocked there.

New house

Westinghouse Electric Supply Co. has opened a branch in North Hollywood at 13213 Sherman Way with Lee Prince as branch sales manager.

Officers

San Diego Chapter of National Industrial Service Assn. elected Elmo Robinson of Electric Motor Maintenance Co. as its president; Therald Clute, Tri-Electricians of El Cajon, is vice-president; and Leon Vance of Webb Bros., Escondido, as secretary-treasurer . . . New officers of the Puget Sound Chapter are Ronald Irving of Industrial Electric, Seattle, president; Carl Strock, Center Electric & Engineering, Tacoma, vice-president; Earl Brooks, United Electric Motors, Seattle, secretary-treasurer.

Lighting course

British Columbia Section of the Illuminating Engineering Society initiates a new course on the fundamentals of lighting, beginning Jan. 7. The 11 weekly lecture course is in charge of J. E. Priestley, Western Lighting Fixture Co. of Vancouver, and will be held at the King Edward High School on successive Monday nights. The course is limited to 150 and registration is $7.50 . . . Douglas S. Gordon of B. C. Electric has succeeded J. H. Gilbreath of Holophane Co. as chairman of the section recently. P. F. Fletcher, Canadian General Electric, is vice-chairman and A. M. Anderson, B. C. Electric, secretary-treasurer.

WHY SMART DISTRIBUTORS STOCK GLOBE

SAFE, SECURE DELIVERY..."Problems of breakage in transit are few and far between with Globe. Their "protective-pack" cartons hold the most fragile of their fixtures safely and securely right to our door."

Robert Mattea, Englewood Electric Supply Co., Chicago, Ill.

FASTER DELIVERY..."I'm always delighted and surprised to see how much faster Globe delivers directly from their stock instead of producing against orders as others do."

C. O. Marionneaux, Interstate Electric Co., New Orleans, La.

A "HOT" LINE..."The 'hot' ones are most often in the Globe line. Their designs are better than beautiful. They are styled to America's lighting tastes."

Jack Minor, Edison Electric Supply Co., Miami, Fla.

EXPERT CRAFTSMANSHIP AND FINISH..."The finer finishes and expert craftsmanship that characterize a Globe fixture go a long way in selling our customers and keeping them sold."

Benjamin Levitt, Avon Electrical Supply, Inc., Jamaica, N. Y.

PROFITABLE LINE..."We heartily endorse Globe's policy of distributing through authorized stocking distributors and backing them to the hilt. This makes Globe fixtures one of our most profitable lines."

Homer F. Davis, San Francisco Lighting & Supply Co., San Francisco, Calif.

more and more distributors are signing up with Globe because...

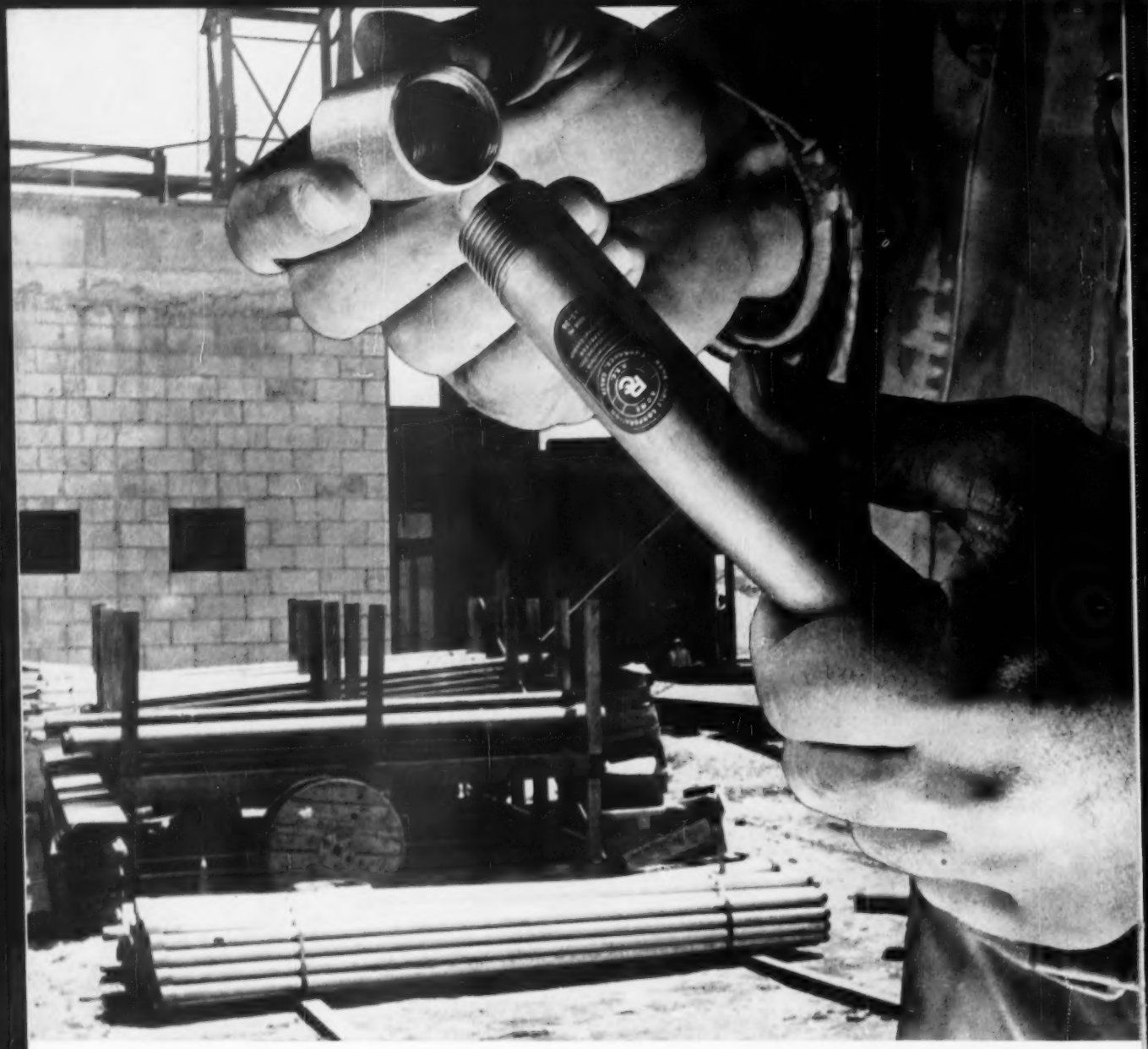
IT'S MORE PROFITABLE TO SELL

GLOBE

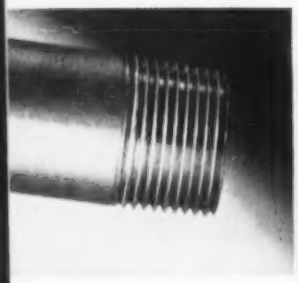
THAN TO SELL AGAINST IT!

Call for a Globe Salesman. Write for the Globe 44-page, full color catalog.
See the complete Globe line at our showrooms: 16 East 40th St., New York 16, N.Y.

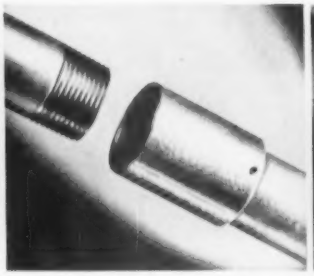
GLOBE LIGHTING PRODUCTS, INC., 1710 Flushing Ave., Brooklyn 37, N.Y. • "For over a third of a century, planned lighting for better living."



Check these six features before you buy another foot



1. Galvanized threads won't rust. Clean and sharp galvanized threads make Rome rigid easy to install. These threads won't rust or corrode during storage, even if left outside. Rome's couplings are completely galvanized, too.



2. Perfect thread fits are assured. Only Rome rigid is cold-formed from hot-rolled sheet steel. This method provides more uniform diameters and wall thicknesses which, in turn, result in better fitting threads.

3. Smooth interior surface makes fishing easy. Each length of conduit is exposed to the zinc bath for exactly the same time at exactly the same temperature. The resulting smooth and uniform coating assures an easy-to-fish interior.

4. Coating resists flaking even under distortion. The adherence of zinc coating to Rome rigid is outstanding. Conduit goes directly from the inert atmosphere of reducing furnace into zinc bath without contacting oxygen or other corrosive elements.

Galvanized inside and out...and on the threads, too

Rome's new rigid conduit stays clean and ready to install— even when stored outside at job!

Rome's new galvanizing procedures assure you rigid conduit that's *ready to use when you need it*. Rome rigid is galvanized inside and out—and on the vital thread area, too—so your crews won't have to spend expensive time at the job site cleaning off rust and getting it ready to install.

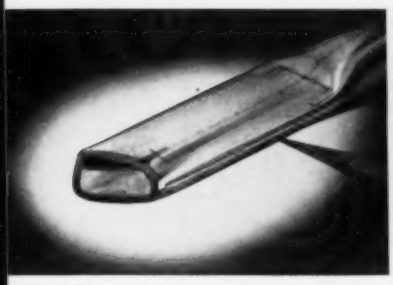
Made of hot-rolled, shot-blasted sheet steel instead of ordinary "skelp," Rome rigid is cold-formed. Wall thickness remains constant, and strength and surface quality is uniform. Electric resistance welding is used to provide added strength and safety. Inside and outside diameters are held to exacting tolerances, and threads are cut clean and sharp. Then Rome rigid is galvanized all over with the exclusive Sendzimir hot-dip process (patented by Armco).

Every single length is then inspected from end to end, and special *color-coded metal thread protectors* are applied. After this, they are bundled and made ready for shipment to your stock or job site.

These painstaking efforts are just a few of the reasons why Rome rigid is your best rigid conduit buy. Specify Rome rigid for your next job. And if you would like more information on this product, contact your nearby Rome Cable sales office—or write to Department 946, Rome Cable Corporation, Rome, New York. Ask for Bulletin C-1.

ROME CABLE
CORPORATION

of rigid conduit



5. Seam welds are the strongest of any rigid conduit. Rome rigid's weld is stronger than the conduit itself. It is the only conduit sealed by electric resistance welding—the method used to weld tubing for such high-pressure products as boiler and condenser tubes.

6. A complete line of Rome rigid is available. You can meet all conduit needs of your next job with Rome rigid. It and necessary couplings are available in sizes ½"–6", conduit is available in 10-foot straight lengths and 90° elbows.

Western Sales Offices

SALT LAKE CITY 1, UTAH
230 South 4th West
(Tel. Elgin 9-8811)

SAN FRANCISCO 24, CALIF.
1100 Selby Street
(Tel. Valencia 6-3580)

LOS ANGELES 22, CALIF.
2510 South Malt Avenue
(Tel. Raymond 3-3631)

SEATTLE 4, WASHINGTON
3430 Fourth Avenue, So.
(Tel. Seneca 3017)

DENVER 3, COLORADO
1160 Elati Street
(Tel. Keystone 4-0533)

PORTLAND 5, OREGON
1224 S.W. Morrison Street
(Tel. Capitol 2-5470)

Even distribution gives perfect visibility in the shopping area of San Leandro, Calif.

Units provide outlet for decorative lighting

Fluorescent Multiple System Flexible

Henry M. Tilson and Ernest L. Nelson

Consulting Engineer, Stelmac Chief Electrical Inspector

Fluorescent lighting has enabled San Leandro to put 17 times as much light on the streets of its business district with only six times as much electric energy. This city has done so in the relighting of its downtown triangle to make it what it boasts as "the best fluorescent lighted streets west of the Mississippi." Formal dedication of the newly lighted area was made with a "Light Up Time" parade and celebration Oct. 4. The new lights were turned on in four sections as the parade moved up the darkened streets.

A special feature of the design was being made use of during the Christmas holiday season to good advantage. Provision was made on each of the standards for support and electric supply to decorative lighting and accompanying display material.

The celebration climaxed more than three years work by local businessmen who realized the need to replace the thirty-year-old system. Early in 1953 merchants in the Del Mar area, in cooperation with the Chamber of Commerce, began circulating petitions to form a lighting assessment district, as provided by California law. Later, downtown merchants started another petition in their area and in 1954 both groups had the necessary signatures to present to the city council.

The type of luminaire and circuits used were determined after a careful study of existing conditions and results desired. Economy dictated using existing conduits, if possible, and city officials wanted to provide an extra circuit for special-occasion lighting. Both conditions were met by placing a control center at a three-way intersection. Thus, six circuits, feeding up to 12 luminaires each, could be fed from one point. Another control center feeds the remaining 37 luminaires by means of four circuits. Fluorescent luminaires were chosen to provide the high-quality lighting desired.

Control center, with Authors Ernest Nelson and Henry Tilson, and Bruce Kunde of L-M

Selected were 101 Line Material V-type units, and one delta type. The luminaires operate at 240 v, and produce 21,200 lumens from four 100-w lamps. The new lamps provide 17 times as much light as the old lamps for only six times as much energy. The delta unit was used at the three-way intersection of Washington Ave. and E. 14th St. Installation was performed by the Abbett Electric Corp. of San Francisco. Pacific Gas and Electric Co. is the power supplier and maintenance is by the city.

The new lights are located on E. 14th St. from Sunnyside Drive to Juana Ave., and on Washington Ave. to West Juana Ave. All 102 luminaires are connected to multiple circuits and mounted on 30-ft steel poles. Spacing is normally 90 ft, with units generally opposite each other.

One feature, unique to the area, is the provision for special decorative lighting. A condulet, mounted on the angle iron frame of each luminaire, provides an outlet for 120/240-v power. A rectangular hooked clip was welded to the street side of each pole, to attach support wires for special decorations.

The new lighting system replaces a series system that used forty-eight 2,500-lumen incandescent lamps. The old luminaires were decorative, but gave little light.

A NEW DIMENSION IN LIGHTING

SHALLORAMA®

A revolutionary new, extremely shallow surface-mounted Visionaire®, the SHALLORAMA brings new dimensions to architectural illumination.

An incomparably shallow, self-luminous structural element, fully enclosed by contoured matte white Plexiglas for soft even brightness and efficient "area" illumination. Blends with ceiling for recessed appearance.

Vast range of application for new or remodeled interiors, for offices, stores, banks, institutional areas, etc.

No latches, no hinges, no visible hardware to mar the SHALLORAMA beauty; diffuser opens from either side with one hand on continuous hinge support.

Years ahead engineering exemplified by reflector-lamp-diffuser relationships and air spaced separation of ballast mounting surface from ceiling.

Patent Pending

Integral, jack-type levelling device compensates for uneven ceilings and facilitates precision alignment in continuous rows. Write for colorful, descriptive Bulletin 763.

SUNBEAM LIGHTING COMPANY, 777 EAST FOURTEENTH PLACE, LOS ANGELES 21, CALIFORNIA

From plaster ring held switch control cable is threaded through bored holes to low-voltage contact of the relay in the outlet box

Low-voltage multiple switching

Convenience Sells Tract Homes

When tract home builders in southern California learned that they could offer more switching convenience as a sales feature and do so with little or no additional wiring cost the trend changed to low-voltage relay switching. Where the wiring code demanded electric metallic tubing it was a perfect answer to the switching problem. But it was discovered, too, that where there were over four or five three-way or four-way switching points in a nonmetallic sheathed cable job the higher cost of the relays was offset by the elimination of long switch legs, switch boxes and labor. This is particularly true with a Remcon system which supplies its own transformer with each relay and no grouping of relays is necessary with long runs of conductor for switching to the relay center.

Tract house designers now specify low-voltage remote switching as a selling feature. Don Shively of Allied Industries has such support from Western Drafting's Jameson

As a result several architects and house-design and drafting companies are now specifying such a system and taking advantage of the switching flexibility it gives them to design more convenience into tract homes. Harbor Highlands, where South Coast Construction Co. is building in a tract near Newport Beach, is an example. Electricians Joe Nichols and Kenny Woods of Grimes Electric are pictured above installing the small three-conductor switch cable in one house of that tract. Another example pictured here is in Lemon Heights West, where Dick Hammond of Sam Franklin Co. is connecting the small switches that need only a plaster ring to support the switch plate. This house is using EMT for all the 120-v system. In this tract Remcon switching is used for all switches, even single-pole applications.

For the jobs wired in nonmetallic sheathed cable, while the cost per

Three-conductor cable from switch is fastened to joists with stapler. This saves conduit and switchboxes for switch legs, speeds job

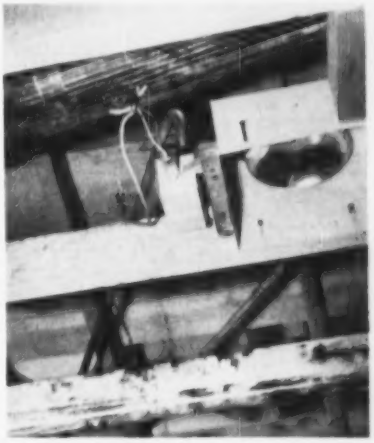
single-pole switch would be higher, including installation and the cable, on three-way and four-way points savings are made. Most houses have seven to nine such points. Another advantage is that later a master control can be installed at relatively little expense or difficulty.

Another saving is made in the safety of a 6-v switching system. None of the switch points need to be grounded, even near sinks or in bathrooms or near grounded surfaces. There are no switch boxes to bond to the grounding system. Another feature is that the three-conductor, No. 18 wire used from the switches to the relay can run as far as 165 ft without affecting the operation of the relay even at 6 v. The system can also be used for switch control of garbage disposal, room fans, infrared and sun lamp ceiling installations, a remote coffee maker receptacle, in fact, motor loads up to ⅓ hp, resistance loads up to 10 amp, T-rated lamps up to 5 amp. Soon a portable kit with a cord that can be plugged to a receptacle will be available for remote control of a radio, TV set, lamp, fan, etc.

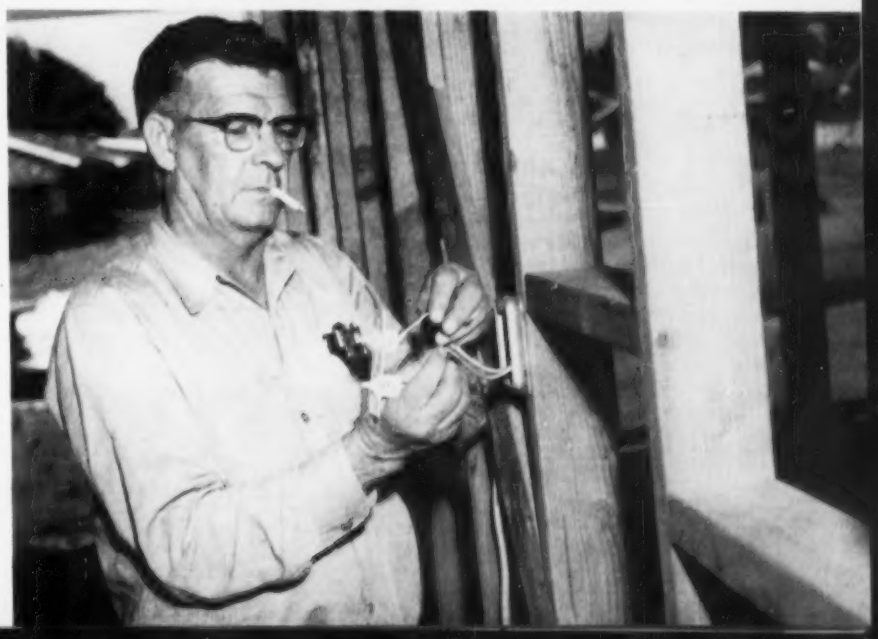
What the architects like about it is that it permits them to offer the client more switching points without increasing the cost too greatly. Also that the small switches can be grouped up to five to a plate, thus requiring less wall space. The switchplates can be painted to match the interior decor. A new rocker-type switch soon to be on the market will further enhance the modern decorative effect. Master control to operate up to 32 relays from one center will also be available, it is said.

While the system goes in quickly and thus saves labor on individual units of installation, the electricians have found that it encourages more three- and four-way switching, more automation and brings up the labor content to more than a held down conduit job. For the electrical contractor it brings a better profit margin and installation of more facilities for electrical living.

Like many things in the industry low voltage relay switching has had more obstacles from within the industry than the public. First suggested by ELECTRICAL WEST articles in 1946, the "push button" switching at last shows signs of having arrived when tract builders feature it to sell.

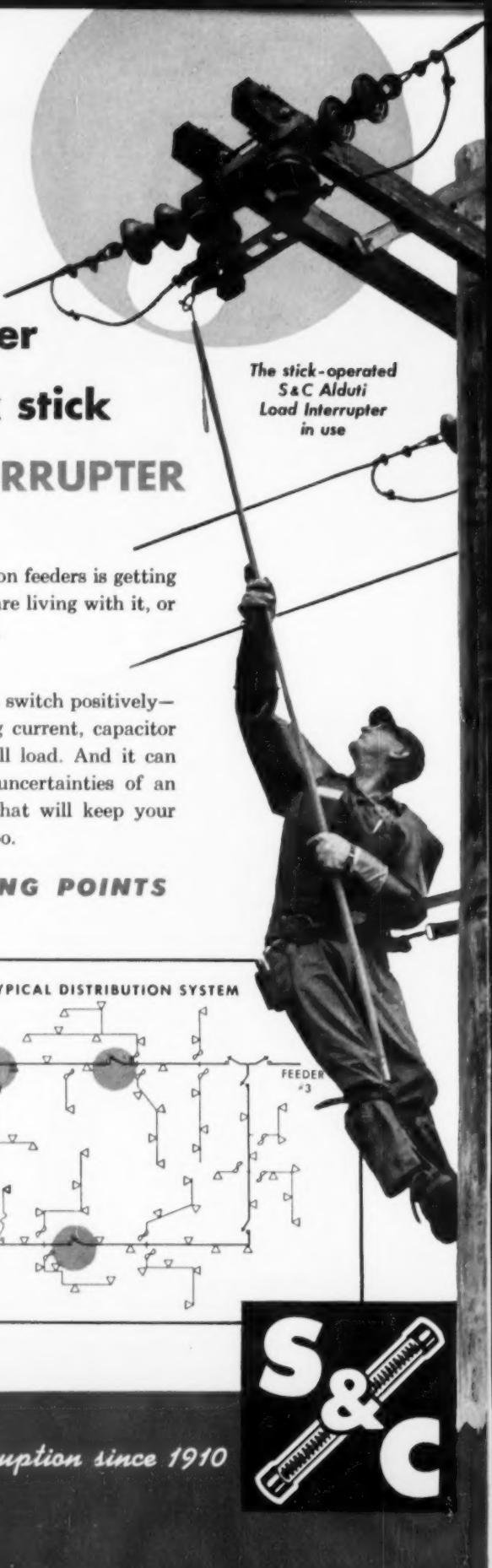


Access to relay is through recessed unit



Several small switches can be mounted on one plate that is held by a plaster ring only

he can switch your 12 kv feeders anywhere, any time, under any load with a hook stick using an S&C LOAD INTERRUPTER



The stick-operated S&C Alduti Load Interrupter in use

Sure! The switching of your 12 kv distribution feeders is getting tougher and tougher! Maybe your linemen are living with it, or maybe you are spending a fortune just to get by.

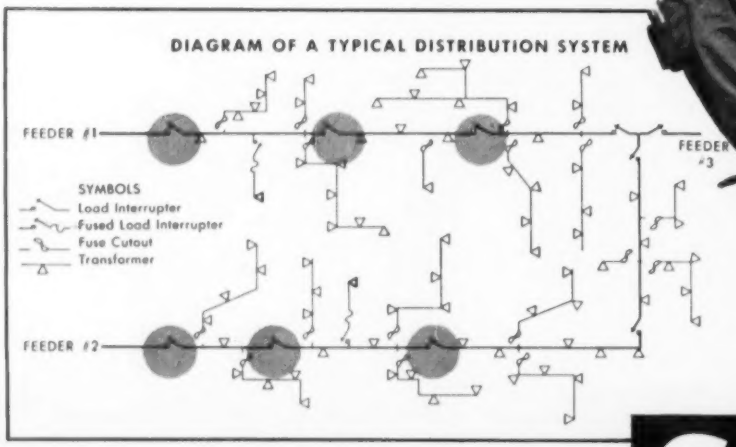
Is there another alternative?

Certainly! A stick-operated S&C Load Interrupter. It can switch positively—under any condition—any load, whether it's line charging current, capacitor charging current, magnetizing current, or full load. And it can be done without the hazards and uncertainties of an external arc. Here's a switch that will keep your linemen happy, and the comptroller, too.

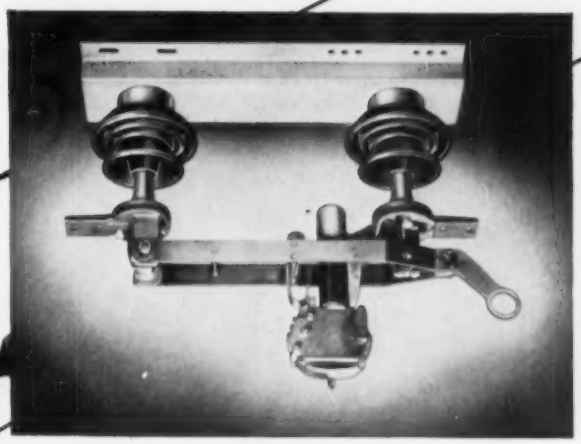
USE IT AT SECTIONALIZING POINTS

On 12 kv *radial* circuits, increased loads have made switching at sectionalizing points virtually impossible with conventional disconnects. On *loop* circuits (right) it's difficult enough where the duty involves only switching in parallel. And if the tie switches are open, hazard-free circuit interruption can be an impossibility.

Here, S&C Load Interrupters will give you safe, positive, circuit interruption on full line voltage and full load current—an advantage under emergency conditions, and a convenience under normal circumstances.



Specialists in High-Voltage Circuit Interruption since 1910



The S&C Load Interrupter, Alduti type; outdoor, single pole, (stick-operated); 14.4 kv, 600 amp. Three-pole, group-operated load interrupters are also available.

Load Interrupter Performance Comparison

PERFORMANCE	S&C Load Interrupters		Conventional Disconnects	
	Stick-Operated	Group-Operated	Stick-Operated	Group-Operated
Interrupt current from parallel sources safely?	YES	YES	DOUBTFUL	DOUBTFUL
Safe to equipment or personnel if inadvertently opened on full voltage (in case loop is open)?	YES	YES	NO	DOUBTFUL
Dump load without opening feeder breaker, or without preliminary unloading?	YES	YES	NO	DOUBTFUL
Multi-pole device controllable from ground (may be required by system practice or other circuits on same pole)?	NO	YES	NO	YES
Interrupt line charging current safely?	YES	YES	NO	DOUBTFUL
Cost?	LOW	HIGHEST	LOWEST	HIGH

The S&C Load Interrupter can switch the circuit without unloading preliminaries and without opening the breakers. The use of S&C Load Interrupters cannot lead to dangerous phase-to-phase or phase-to-ground faults, because there is NO EXTERNAL ARC. Also there is no danger to men or equipment in case of inadvertent operation. The S&C Load Interrupter breaks all load and charging currents instantly and decisively. Besides, you can mount it in any desired position —vertical, upright, or inverted. Write today for Catalog Section 760 on S&C Load Interrupters.

LOAD INTERRUPTERS

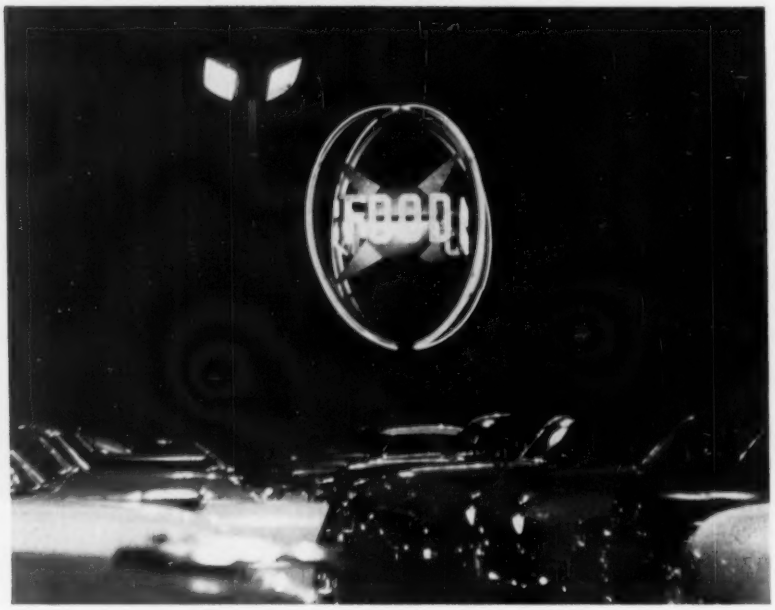
S&C ELECTRIC COMPANY

4428 RAVENSWOOD AVENUE • CHICAGO 40, ILLINOIS, U. S. A.

In Canada: S&C Electric Canada, Ltd., 8 Vanice Road, Toronto 14, Ontario

POWER FUSES • DISTRIBUTION CUTOUTS AND FUSE LINKS • LOAD INTERRUPTERS • METALCLAD SWITCHGEAR

Parking area lighted by fluorescent fixtures



Rotating neon sign contrasts its color with the well distributed general illumination

Salt Lake City's newest supermarket

Combines Light and Weather

Two-lamp strip over counter and four-lamp units over back shelves under drop ceiling

Twenty Weathertrons and 400 kw of lighting are teamed to heat, cool and light Salt Lake City's largest and newest supermarket, one of the Grand Central chain owned by M. Warshaw. From an electrical standpoint the combining of the lighting heat loss with the reverse-cycle refrigeration Weathertron application is most interesting.

Arty W. Clark, electrical engineer, designed the system so that in seasons when all lights may be turned off, if the heat pumps cannot take care of the heat loss load, 10.4 kw of resistance heaters in each of the 20 units are cut in by relays. It is so arranged that, when such load is called for, it is fed from the lighting feeders in the area in which the unit is located.

The heat pump units are located in banks at five points in the store. There are three banks of four units, one of three and one of five. In general, these are mounted on balconies above the floor. The resistance heater boosters are restricted from coming on when the lights are on by six relays that are energized by the lighting circuits in the area. Each Weathertron is a 7½-hp unit, making a total air conditioning load of 202 hp. In addition there is 165 hp of refrigeration used in dis-

Flush units with reflector flood lamps in the canopy light entrances. A sample of the type of Weathertron used is on display at entrance

play cases, meat department and for refrigerated storage. An unusual feature is that garbage is kept refrigerated until removed.

Major attribute of the lighting is that there is so much of it. General illumination is from bare-tube four-lamp slimline fixtures covering the ceiling. This is supplemented by incandescent spots or floods wherever needed. There are 384 96-in. slimline fixtures with four lamps each. Lighting load totals 400 kw, or an average of 5 w per sq ft. Levels were designed by Clark to give an average of 120 f-c maintained. It runs from 100 to 140 f-c. In the vegetable and bakery areas where the fluorescent is augmented with incandescent for color, intensities range from 150 to 180 f-c.

Parking area lighting is done with 76 fluorescent Nu-Art 4-lamp units with 6-ft, 100-w lamps operated at 1,000 ma. Many are mounted double.

Because 480 v was not available from Utah Power & Light, the system uses 120/208 distribution. Considerable wire economy could have been effected with a 480/277 system for lighting although the demand for 120 v for refrigerated cases, cash registers, etc., might have offset the economy.

Architects for the supermarket were Woolley and Mohr. Sisam Electric Co. made the installation of wiring. Young Sign Co. designed and erected the sign.

General lighting in grocery section is done with rows of 4-lamp units on a high ceiling. Louvered flush fixtures used in sundries area where the ceiling is lower; stock on tables

ELECTRICAL WEST

Prosperous New Year

TRADITIONALLY January 1 is the time for making resolutions and taking a look into the crystal ball to see what lies ahead. It's the period when figures are analyzed, predictions are made and decisions are crystallized.

1957 was ushered in under unusually optimistic auspices. It's hard to find a pessimistic business economist and the general air of business confidence is reflected in the plans and programs of business organizations across the country.

The first two articles in this issue make good reading for all those who are at all in doubt about the current business climate.

Together they paint a bright future for all of us who are fortunate enough to live in the United States and make our living in the electrical industry.

New Look—Better Service

IN case you have not already noticed it, there is a new look to this issue of ELECTRICAL WEST. There has been a regrouping of editorial material that we hope will facilitate convenience in reading the magazine. A new feature, regional editorial roundups, has been added to keep you more fully informed concerning industry developments within your own area. Likewise, a new page of statistics on Western electrical industry growth makes its appearance for the first time, on p 5.

To make these things possible, the editorial staff has been augmented by the addition of regional editorial representatives who will cover developments in the Pacific Northwest, the Intermountain, the northern California and the Pacific Southwest regions, respectively. Through them, the magazine will be in closer and more intimate contact with local area developments than ever before. Their reports will keep you more fully informed about people and events of specific regional significance.

Still another approach to enlarged and improved editorial programming is the reconstitution of our editorial advisory board on a regional basis. Through this measure, it will be possible to focus top-level executive thinking more frequently on ways and means to put our editorial service to work to serve better the broad objectives of the industry.

ELECTRICAL WEST is the one clear channel of communications between all elements of the electrical industry in the eleven Western states. The changes that are now being made in its editorial operations are aimed at making the contents of each issue more vital and meaningful to its 12,000 readers. We hope you like them and, as always, the staff welcomes suggestions, constructive criticisms or comments that will help the publication do its share in building the West—*electrically*.

Expanded Education

IT might be considered typical of today's civilization (and perhaps significant in the light of Roman history) that the first major use of closed-circuit, large-screen television brought spectacular sporting events to the nation. A cynic might add that the next extensive application of closed-circuit TV was to stimulate sales organizations. Why is it, in the light of the need for faster and better educational methods that there has not been a concerted effort to provide educational institutions with their own closed-circuit TV network?

Think of the possibilities if, on the campus of each of our major universities, there was one auditorium or lecture hall equipped with theater screen television and connected with every other center of learning in the country. Imagine, if you will, what it would mean to youthful students if they could be stimulated by the nation's best minds in the various fields of endeavor through the educational programming possible with this new medium. Visualize the benefits of medical students all over the country witnessing an operation at Johns Hopkins, or science students taking an inspection trip, via TV, through the cyclotron laboratory at the University of California. Visionary? Perhaps. Impractical? No. Possible? Only if American business

EDITORIAL VIEWS

and industry would tackle the job of setting up such a network in the same way that it has demonstrated it can meet and solve other civic and social problems, many of which are of even lesser importance.

It undoubtedly would be costly to set up a network. The return would not be measured in dollars and cents. But who can put a price tag on the over-all benefits of multiplying the efficiency of our educational facilities and extending the influence of our leading educators? It might be unkind to mention it, but if the Russians had the same opportunity and facilities it is doubtful if they would use them to sell borsch or amuse the citizenry with bear-baiting contests.

Forward or Backward?

AT least one manufacturer will ship 1957 models of electric clothes dryers equipped with 110-v cord, with option to change to the 220-v pigtail if the customer has the required wiring. Practically all designs and brands of modern dryers will operate on either 110 or 220 v depending on whether the heating elements are connected in series or parallel.

Arguments favoring the use of dryers at 110 v include those of economy, inasmuch as the cost of a 220-v circuit is eliminated. As it is then a plug-in device, its purchase becomes much more appealing to the renter or apartment house dweller who shows very little inclination to make a permanent investment in wiring.

Admittedly at 110 v, drying time is practically doubled. This does not make it compatible with the washing cycle of the automatic washer but proponents of the 110-v use point out that the clothesline wasn't either and, furthermore, the housewife's clothes-washing habits have changed since she tried to do the entire week's wash in one day's time. It is a fact, too, that one West Coast utility has checked users of dryers operating on 110 v and found little, if any, complaint about the length of drying time among users.

Supporters of the 220-v dryer's service maintain that speed in drying is necessary to give complete customer satisfaction and to make electric applications competitive with the drying cycle of the gas machine. Both the 220-v electric dryers and the gas dryer require costly service installations so that there is no real competition on that point. They do, however, point out that the dryer load on the normal 110-v circuit can result in poor service and even a fire hazard. They are concerned over the tendency to emphasize unit sales rather than customer satisfaction.

The one point of agreement is that the subject is extremely controversial at the present time. It appears that a considerable number of electric dryers that will be sold during the coming season will operate as a plug-in appliance. If there is any general trend in that direction, all branches of the industry should be on the alert to determine just how satisfactory 110-v dryer service is from the customer's standpoint.

BUSINESS is the bringing of people together so that they can do more for each other than they could do as individuals.

Business is at a low point in history because both political parties are afraid to befriend it.

Businessmen have by and large done the required job (of satisfying the people's material needs) quite well, but they have failed to successfully win public understanding, approval and support for their objectives, activities and results in the remaining areas in which people are interested or affected.

Business will neither overcome its current political helplessness nor improve the climate in which it must operate until the general public understands how business serves the many and not just the few.—Quotes from an address before the California Manufacturers Assn. by L. R. Boulware, vice-president for public and employee relations services, General Electric Co.

NEWEST WESTINGHOUSE TEST CENTER . . .

World's largest transformer laboratory to prove performance beyond 500,000

Here's a Westinghouse investment that is now adding value to every dollar you put into Westinghouse power transformers. In one vast new facility is a combined commercial and experimental testing laboratory at the Transformer Division, Sharon, Pa.

From this ultramodern laboratory, used primarily for research and development, will come transformers of the future. The new anechoic vault, for example, will make complete sound measurements to and beyond 500,000-kva ratings; find ways to throttle structural resonance; ferret out strengths and weaknesses of new core materials and processes; speed inquiry into new methods of reducing vibration and sound.

In the high-voltage laboratory, new insulation systems are being developed. Here, models — and full-scale transformers — are tested to destruction. This laboratory is equipped, in fact, to evaluate total electrical performance of the largest commercial units predicted for a decade ahead.

Here today is equipment that immeasurably strengthens the promise of performance in things to come — from Westinghouse.

J-70783

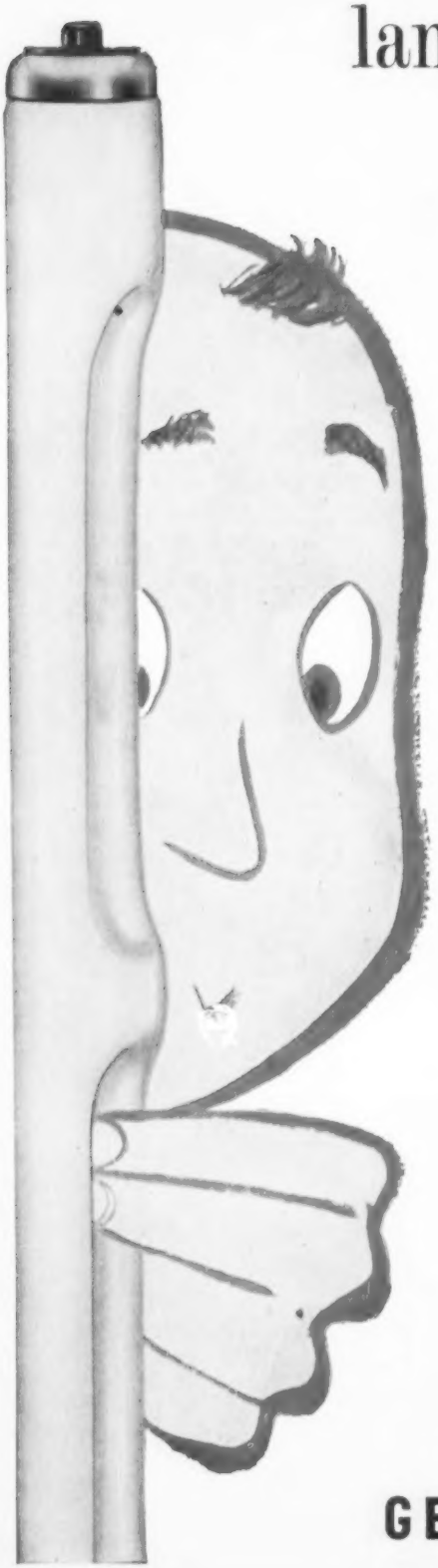
WATCH WESTINGHOUSE!

*WHERE **BIG** THINGS ARE HAPPENING FOR **YOU**!*

KVA

M. E. Fagan, Engineering Manager, Transformer Division, and model of world's most modern transformer laboratory at Westinghouse. Facilities include surge generators at 600,000, 4 million and 5 million volts; a 1,050,000-volt, 60-cycle test set for insulation; a 180,000-ampere impulse generator; a completely shielded sound chamber for radio interference testing of small power transformers and components.

The shape of fluorescent lamps to come



New General Electric "Power-Groove" discovery means more light for you . . . at less cost

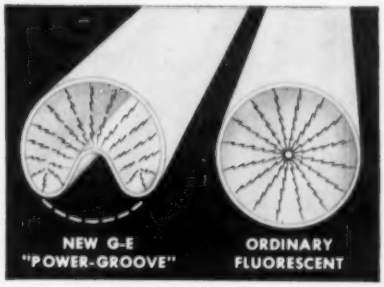
Look at this new kind of fluorescent lamp. It's the General Electric "Power-Groove"—a revolutionary new development created by G-E engineers. It not only gives more than 2½ times as much light as the 8-foot slimline (most widely used 8-foot fluorescent), and lets you save more than 20% on your initial cost, and has fewer parts to maintain . . . but it even *looks* different—for a reason.

It's the grooves in General Electric "Power-Groove" Lamps that make possible a greater increase in light-per-foot than all the combined increases made since General Electric introduced fluorescents in 1938!

The new G-E "Power-Groove" Lamps are the popular 8-foot length (200-watts) with 4-foot sizes also available and 6-foot sizes later. They are Rapid Start lamps that need no starters—and are to be used in fixtures and circuits designed especially for them.

IF YOU'RE PLANNING a new lighting installation—you'll want to investigate G-E "Power-Groove". New G-E "Power-Groove" lamps are going into some installations right now! You'll be able to buy them . . . and the fixtures . . . in quantity by midsummer, so get the whole story now. Call your local G-E Lamp Supplier or write: General Electric Co., Large Lamp Dept., Nela Park, Cleveland 12, Ohio.

COMPARE! The new G-E "Power-Groove" construction (left) works 3 ways to give more light. One: it places some of the light-producing phosphors closer to the energizing area in the center of the lamp. Two: it presents a greater surface area which permits the generation of more ultraviolet rays to activate the phosphor. And three: it makes the lamp run cooler—which permits a higher current design and gives you more light per watt.



Progress Is Our Most Important Product

GENERAL ELECTRIC

Need a Limit Switch?

WHAT'LL YOU HAVE?

Here are samples of A-B quality limit switches—a line so complete it will satisfy your every requirement!

OILTIGHT

Bulletin 802T—For high-speed production machines. Sealed to protect the switch against oil and coolants.

GENERAL PURPOSE

Bulletin 801—Standard or heavy-duty rating, with roller, push type, or fork lever action, and slow or snap action contacts.

Bulletin 803 Cam Limit Switch used on rotating machines to open and close circuits at any desired angular position.

PRECISION

Bulletin 802—For applications where mounting space is small and operating motion is measured in thousandths of an inch.

1-57-MR

ALLEN-BRADLEY

QUALITY

MOTOR CONTROL

A-B Quality

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis. • In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

PILOT CONTROLS?

Yes...Allen-Bradley covers the field!

No matter what your needs for pilot control devices may be . . . refer to the new Allen-Bradley "handy" catalog . . . you will usually find what you are looking for. If not, please write Milwaukee, or contact your nearest Allen-Bradley representative.

All pilot controls are made to Allen-Bradley standards of quality. All of them have silver alloy contacts that require no service attention. You'll find it saves service time and money to specify Allen-Bradley.

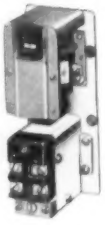
PHASE FAILURE AND PHASE REVERSAL RELAYS
BULLETIN 812
Style A disconnects motor if one phase of power circuit fails. Style B protects against phase reversal, as well.

OILTIGHT PUSH BUTTON STATIONS
BULLETIN 800T
For machine tool applications, to keep oil away from the contacts. Available in flush, surface, or pendant mounting.

PRESSURE CONTROLS
BULLETIN 836
For noncorrosive liquids, vapors, gases, from 30 in. of vacuum to 700 psi. Accurate, rugged, compact, and attractive appearing.

PLUGGING SWITCHES
BULLETIN 808P
Used with a simple reversing switch, it provides quick, automatic stopping of machines driven by squirrel cage motors.

TIMING RELAYS
BULLETIN 849
A reliable and accurate pneumatic timer with a range of 1/6 to 180 seconds. Many arrangements. Motor driven, electronic and oil dashpot timers also available.



TEMPERATURE CONTROLS
BULLETIN 837
For temperatures from −45°F to 440°F. Metal bellows operates snap action precision switch with pure silver contacts.

FOOT SWITCHES
BULLETIN 805
For operating punch presses, riveting, welding, and many other machines. Switch has snap acting, normally open and normally closed silver alloy contacts.

ZERO SPEED SWITCHES
BULLETIN 808
A plugging switch that brings squirrel cage motors to zero speed quickly, without any reversal of direction.

FLOAT SWITCHES
BULLETIN 840
Provide automatic control for motors operating tank or sump pumps.

PRESSURE SWITCHES
BULLETIN 830
For domestic water pumps, and commercial and industrial air compressors.

ROTARY SWITCHES
BULLETIN 806
Cam operated switches for the selection or transfer of various control circuits. Silver alloy contacts.

1-57-MR

A-B Quality

ALLEN-BRADLEY
MOTOR CONTROL
QUALITY

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

Send for the new 7th Edition of the Allen-Bradley Handy Catalog. It is a veritable encyclopedia of reliable motor control.

Idahoans Mesh Gears for Coordination

Bruce Falkner Young Gudie Koch Worthen Toedtemeier

To launch 1957 as its "year of coordination" and to get all "on the bandwagon" for promotion of Housepower and Live Better . . . *Electrically*, some 150 Idahoans met in a compact one-day annual fall conference at Boise, Dec. 1, under its contractor-dealer president, H. Ferd Koch, Electric Service Co. It was the second annual meeting of the relatively new Snake River Valley Electrical Assn. Attendance and interest attested to the growth of the organization in its two short years.

So did the report of its 1956 activities, given by its modest president. It had conducted a most successful essay contest among school children on electrical safety during National Electrical Week, one of the few in the West. It had held four Live Better . . . *Electrically* meetings in southern Idaho. It organized and ran the Boise Home Show, in which there were 100 exhibits. It had sponsored the Parade of Homes in Boise, resulting in exhibiting 10 all-electric homes to more than 16,000 people.

In addition, it has sponsored the Housepower program, held an industry-wide clinic at Nampa, created three new chapters in Boise, Twin Falls and Pocatello, offered a group insurance program in which 200 participate and rendered old ice boxes and refrigerators harmless to children by lock removal.

Koch announced the 1957 program to be aimed at increased membership, more insurance participation, home show and Parade of Homes sponsorship with possible extension of these to other areas. The league will encourage sales schools, have a legislative program to watch proposed state electrical law affecting its members. It will promote Housepower and LBE. Its women's auxiliary—the Live Wires—will also get into the program more vigorously.

At a general session in the morning and a men's luncheon, industry speakers presented informative and inspirational messages. The afternoon was devoted to three parallel seminars or forums that took in the interests of the seven divisions of the association—retailers, distributors, contractors, manufacturers, electronics, appliance repair and utility. Joe Wright, Afton-Lemp Electric Co., was program chairman and presided in the morning.

A graphic picture of Idaho's resources, industries, population and potentialities was given by James H. Young, Secretary of State. In a state whose 300,000 total population is less than that of many small cities, he enumerated the services and facilities that its economy supports. A growth in industry was described in what had once been a predominantly agricultural state.

The IES in Business that Tom E. Shearer, president of the College of Idaho, Caldwell, spoke about was not the Illuminating Engineering Society but stood for Integrity, Ethics and Salesmanship. He urged all to be proud to be salesmen. Selling isn't merely a way to make a living. It is the distributive process by which to move the product of manufacturers to the users. Selling is therefore a "part of a dynamic economy that will succeed only if you salesmen do."

"It is not only ethical to make a profit," he said, "but it is mandatory. Most of what we have and have built has been done so on that principle."

"Our part is to see that there are no roadblocks for you so that you may move full speed ahead as far as supply of electricity is concerned," Tom Roach, president, Idaho Power Co., told the assembled industry members. To do so requires a longer range view ahead than one year. Utility planning for generating capacity must be for from five to 10 years in the future.

Roach showed with charts how the company's loads in all fields had increased in the past 10 years at a ratio of from three and one-half to seven times the load in 1945. Since power sparks all programs and Idaho's growth has been greater in percentage than any Northwestern state, the company will invest $260,000,000 in venture capital for generation and distribution. The Brownlee plant on the Snake River will compress in three years available new capacity of 300,000 kw, as much as it has taken the company 40 years to build in the past.

He also told of the company's participation in the atomic energy research to ready itself with experience and knowledge for peacetime use of atomic power.

With such horizons for limitless growth in the electrical business, a contractor, dealer or a distributor should not fence himself in by bad practices that will restrict him. This was the message that A. H. "Bill" Gudie, president of Biddle Trade Publishing Co., Los Angeles, gave at the luncheon. Significant was his contrast of the industry. In earlier times it was a promotional or pioneering one. Today it has become a serving one to the public that accepts electrical living and the means with which to do so as a necessity. That public is often far ahead of those in the business and more willing to buy and pay for these services than the contractor or dealer is ready to sell them. Cheapening and cheating the job or the service in order to compete on cut price puts a limit on the growth of the industry. (This address will be published in full in a later issue.)

What Retailers Discussed

Appliance retailing problems were hashed over in a retailers' session, presided over by P. R. Mortimer of Idaho

Contractor-distributor panel—Keith, Wright, Falkner, Shotwell and Kurlin discuss policies

President Koch; Mrs. and Mr. Tom Roach

Power Co. A panel of prominent retailers was led by W. H. Burke, manager of the C. C. Anderson Co. Boise store.

Credit policy discussion led to the recommendation that finance companies reduce reserve charges. Credit experience has been good enough to justify such reduction, it was felt.

On servicing, the group felt each dealer should service the appliances he sells. What it may cost is repaid in good will, they agreed.

The retailers would have SRVEA continue its program, with increased emphasis on cooperation on many projects that can be worked on together. The association, it was felt, can help clarify the service problem regarding TV picture tube replacement. Possibly some financing plan can be developed for this. Increased promotional help from distributors was asked. Dealers felt it would be more helpful if they received aid in preparing better local ads than the mats of manufacturers merely repeating national advertising. A more dynamic and local interest type of advertising was felt to be needed urgently. The utility was also asked to consider cooperative ads with dealers.

Contractor-Distributor Relations

Contractors and supplies distributors met in a forum under Lysle Keith, Enterprise Electric Co., Boise, as chairman, who advocated: "Get acquainted with your competitor. You can only make as much profit as he will allow you."

Carl Baldridge, state electrical inspector, discussed the operation of his field inspectors and the state law's enforcement. Concern was expressed over the advertising of "plug in any outlet" clothes dryers by manufacturers. New services and more wiring are needed for the added loads dryers introduce.

That "there is an overhead" was proved by A. R. Woolley, manager, Utah-Idaho Chapter, NECA, from Salt Lake City. With charts of figures, he showed why a contractor must add approximately 60% to his labor cost in order to pay the insurance, social security, supervisory and office cost connected with electricians' wages.

At a panel on distributor and contractor relations, many of the tensions between the two over such questions as furnishing material take-offs were talked out. The discussion was frank but friendly and perhaps both sides understood each other's viewpoints a little better for it. On the panel were Merritt Shotwell, Shotwell Utility, Twin Falls; Albert Kurlin, C L Electric Co., Pocatello; Joe Wright, Afton-Lemp Electric; and Henry Falkner, Westinghouse Electric Supply Co., Boise.

Repair Service—TV and Appliance

Both the appliance and the TV repair and electronics divisions met together to discuss their peculiar problems, with Rodney Frost, Boise TV, as chairman and with Herbert S. Pirrong, Easy's Repair Service, representing the appliance group.

That the repair service business is one of a multitude of small parts and a great deal of hand labor at increasing costs was the description of the type of operation given by William A. Cyr, consulting editor, ELECTRICAL WEST. With the retail price of many appliances being lowered by mass production, the margin between the cost of a new appliance and the cost to repair an old one narrows down the opportunity for profit. Hence constant check of costs against return is needed to manage such a business profitably.

Boise's TV location and the difficulties not yet solved to receive network programs make the advent of color reception unlikely for at least a year or more, Harold Toedtemeier of KIDO-TV, Boise, and the vice-president of SRVEA, told the group. The live pick-up problem will probably have to be solved first by more numerous microwave relay stations.

Also discussed were how to handle credit on repair jobs, how to become better servicemen.

At the closing business session President Koch announced the new directors just elected: J. R. Allen, Bannock Electric Co., Pocatello, contractors division; Reed Gould, Reed Gould Service, Twin Falls, electronics; Clark Waters, Waters Refrigeration Co., Boise, appliance repair; Art Sawyer, Idaho Power Co., Boise, utility; Al Stanley, Caen's Hotpoint, Twin Falls, retail dealers; Joe Devine, Westinghouse Electric Corp., Boise, manufacturers; Howard W. Johns, Idaho Hardware, Boise, distributors.

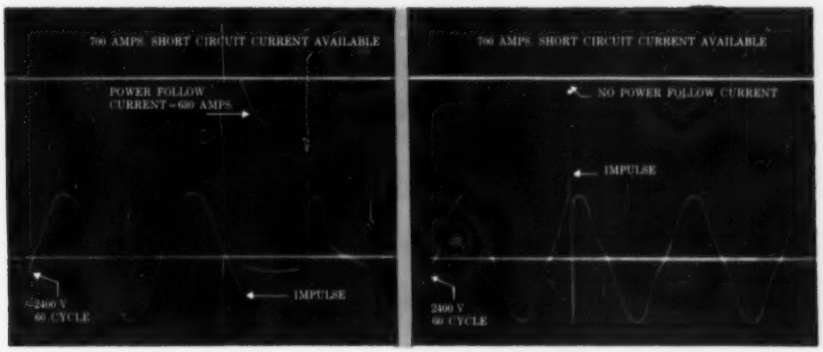
Presidents of the newly formed chapters are: Albert Kurlin, Pocatello, Eastern Idaho Chapter; Merritt Shotwell, Twin Falls, Magic Valley Chapter; Lysle Keith, Boise, Central Chapter.

Credit for the well managed conference was given to the conference committee headed by Paul Worthen; Joe Wright, program; Maynard Smith, arrangements; Morris Saville, banquet; Henry Falkner, hospitality; Dick Egelston, attendance; Carl Young, registration; with Henry Koch, A. S. Gilbert, Vic Goertzen and C. J. Bradford, SRVEA manager, as coordinators and Mrs. Dea Board chairman of the "Live Wires." The latter had a fashion show and luncheon for the ladies.

With wit and poise A. E. Fleming, General Electric Supply Co., Salt Lake City, outdid the entertainment at the banquet for which he was the exceptional toastmaster.

on the line...

AUTOGAP PROTECTS WITHOUT POWER FOLLOW CURRENT!


700 AMPS. SHORT CIRCUIT CURRENT AVAILABLE
POWER FOLLOW CURRENT = 630 AMPS
IMPULSE
2400 V 60 CYCLE
700 AMPS. SHORT CIRCUIT CURRENT AVAILABLE
NO POWER FOLLOW CURRENT
IMPULSE
2400 V 60 CYCLE

DUTY CYCLE TEST!

Conventional Arrester—Under the operating conditions shown on the oscillogram, a 3KV conventional expulsion type arrester duty cycle required 630 amps of arrester power follow current. This additional current generally results in large volumes of expulsion gases, which represent consumed fibre from the expulsion tube. Repeated operations show "tracking" over approximately the same discharge path on each operation with consequent deterioration of the expulsion tube and loss of effectiveness.

Hubbard Autogap—The same impulse current and its effect on a 3KV Autogap. Note that the Autogap conducted surge current only. The exclusive barrier plug develops sufficient deionizing gas pressure from the lightning current alone to operate the Autogap. Autogap has a lightning capacity 150% of standard minimum requirements, negligible discharge voltage for any lightning current. There is no deterioration because there is no tracking. An infinite number of discharge paths are offered to the surge current.

No deterioration after thirteen years!

This unretouched photograph of a fibre barrier plug and electrodes was taken after thirteen years of "on the line" service. The 6KV Autogap Barrier plug shows nine *separate* discharge traceries from natural lightning.

While ordinary arresters discharge through the same path each time, lightning discharges around the edges of the Autogap barrier plug, resulting in an infinite number of different discharge paths.

HUBBARD AND COMPANY

6301 Butler Street, Pittsburgh 1, Penna.

PCEA Equipment Workshops give a look at new appliances and methods. These pictures taken at Los Gatos show scope of program

Know How Clinics help teachers

Keep Housepower Working

BECAUSE showing women how to get better service from their appliances has long been one of their jobs, the industry's home economists are taking a very active part in implementing the Live Better . . . *Electrically* and Housepower programs.

This year the PCEA Home Economics Committee is tying in its program with these two industry promotions. On March 1 during the Business Development Section conference in San Francisco, the committee will sponsor a breakfast with Helen Kirkland, women's interest consultant for LBE, as guest speaker. The equipment workshops for home economics teachers, too, are pointing up the LBE and Housepower slogans.

The Southern Section started its Know How Clinics on Oct. 6 with an all-day session for teachers in the Santa Monica area and has scheduled a second workshop for Feb. 9 in Pomona. The Santa Monica program was presented in Southern California Edison's

Northern Section (upper photo)—Chairman Mary Kelly, Philco; Estelle Gaylord, Maytag; Clara Sherburne, Hotpoint; Marguerite Fenner, PG and E; Nancy Johnson, Westinghouse; Jessie Hughs, PG and E; and Betty Buettner of General Electric. Southern Section (lower photo)—Betty Stalker, Maytag; Pauline Eliker, Edison; Evelyn Conant, Edison; Dorothy Huse, vice-chairman; Ruth Kruger, Arizona Public Service; Mary Jane Isenburg, G-E Appliance; and Lorine Croft of WESCO

Electric Living Center, with 110 teachers attending. Built around the theme, *Housepower Working*, live demonstrations by committee members brought out features of modern electrical equipment and told how to use it. Laundry unit, dishwasher, refrigerator, freezer, range and small appliance demonstrations were climaxed by a dramatic showing of the new electronic oven.

The Northern Section held its first Equipment Workshop Dec. 6 in the Los Gatos Union High School with some 60 teachers attending. This will be followed by workshops at Marysville, Feb. 9, and Fresno, March 9. For the convenience of teachers who did not want to give up a Saturday in December, the Los Gatos session was held from 4:15 to 9:30 on a school day. At a "nosebag" dinner, sandwiches brought by the teachers were supplemented by turkey, salad, dessert and coffee prepared by the PCEA committee and by food used in the small appliance demonstration.

The range demonstration at Los Gatos took a look into four homes where the housewife was less than satisfied with electrical living. Poor results for which the electric range is commonly blamed, but which are really chargeable to the user's inexperience or carelessness, were brought out with a humor that got over the point without leaving a sting.

At both workshops the demonstrations were expertly presented and combined a community service with a good selling job. Even the most experienced teacher could not fail to benefit from the information on new equipment and techniques. And by the time the demonstrations were over few could help wanting to live better electrically.

Mary Kelly, Philco regional home economist at San Francisco, is committee chairman this year. The program in the south is headed by Co-chairman Dorothy Huse, formerly with Sues, Young & Brown and now on TV with a home economics program. Committee members—Southern Section: Pauline Eliker and Evelyn Conant, Edison; Lorine Croft, Westinghouse Supply; Ruth Kruger, Arizona Public Service; Mary Jane Isenburg, G-E Appliance; Betty Stalker, Maytag West Coast; Betty Cook, Tucson Gas & Electric; Marjorie Helm, California Electric Power; Mary Means, San Diego Gas & Electric; Crystal Strickler, Southern Nevada Power. Northern Section: Marguerite Fenner and Jessie Hughs, PG and E; Nancy Johnson, Westinghouse; Betty Buettner, G-E; Estelle Gaylord, Maytag West Coast; Clara Sherburne, Hotpoint; Edna Poyner, Norge; Erma Meeks Boyen, Hawaiian Electric.

Instructors for the two series of classes—W. R. Sears, John Walsh, H. D. Wisser, R. L. Sawyier, C. W. Macy and James Barnes. They made a tour of 12 northern California towns

One-Night Stands Teach C-L

OUT into the country went Certified Lighting and they ate it up. After running two courses of contractor training on Certified Lighting layout and selling in the metropolitan areas of northern California, the Northern California Electrical Bureau has just completed a tour of 12 towns to bring instruction there. Instead of a course of six two-hour sessions like those in San Francisco, Oakland, San Mateo, Stockton, San Jose and Fresno, the tour gave the course in two six-hour sessions a week apart. It began Oct. 22 at Auburn and finished Nov. 30 at Eureka.

Total attendance for the two-night stands course was greater than for the courses in the metropolitan cities. There was a total attendance of 247 in the 12 schools. The smallest group was at Merced, where 11 attended. The largest group was at Bakersfield where 34 attended. Ukiah had 30, all but one of the eligible persons in the area. There had only been 210 total for the metropolitan area schools previously.

Distribution of enrollees was excellent too. Of the 247 total, there were 114 contractor owners of businesses and 35 of their representatives, such as foremen or estimators. There were 14 architects, five consulting engineers, eight from industrial firms. Distributor salesmen attending numbered 17. City and county employees, such as electrical inspectors, school superintendents, etc., totaled 13. Pacific Gas and Electric Co. personnel, who made arrangements and brought attendance, totaled 41 in the 12 towns. Practically all attended both sessions.

The two sessions were conducted by three instructors apiece. The first session, on theory and practice, had W. R. Sears of Sylvania on "More Lighting Business for You"; John Walsh, PG and E, on "Lighting Fundamentals and Design"; and H. D. Wisser, G-E Lamp Division, showing "Lamps —and the Job They Do." Winding up the first class was an exercise to apply the information gained on design and lamps.

Second session was entitled "Application and Payoff." Its instructors were three illuminating engineers and supervisors of PG and E, R. L. Sawvier, C. W. Macy and James E. Barnes. By popular demand, a special part of the session was devoted to residential lighting. It concluded with sales strategy in preparing proposals, answering objections and closing the deal. In some places the classes were held morning and afternoon; in others afternoon and evening.

The instructors, many of whom had been on the other schools, noted the more eager interest and response from the smaller town schools. To many, it was a very first opportunity to participate in such training.

Already reports from the field indicate that participants are making use of their knowledge and are closing jobs in numbers. From Merced where only 11 attended, by mid-December six jobs had been sold for certification. Architects who attended are writing it into their plans. There is even demand growing for a follow-up class next spring.

John Harrell, Manager Voltage Regulator Sales, points out that URL-16 feeder regulator with new CVR relay and instant-response Geneva gear tap changer combine to offer superior regulation with less maintenance.

Westinghouse 16-step regulation means you carry greatest load, produce most revenue

URL-16 with new CVR relay performs three exclusive functions:

1. FASTER CORRECTION OUTSIDE SET BANDWIDTH

The new CVR relay designed with inverse time characteristics actually evaluates the need for speed of response . . . steep voltage variations are corrected more quickly than gradual voltage changes. Result —a narrower effective bandwidth.

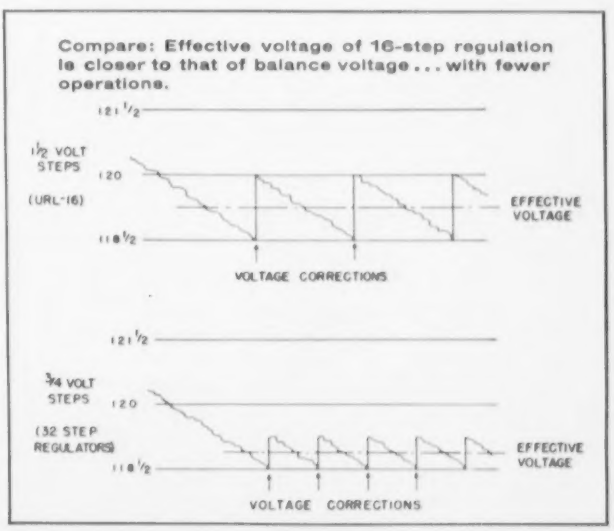
2. INSTANT-RESPONSE TAP CHANGING

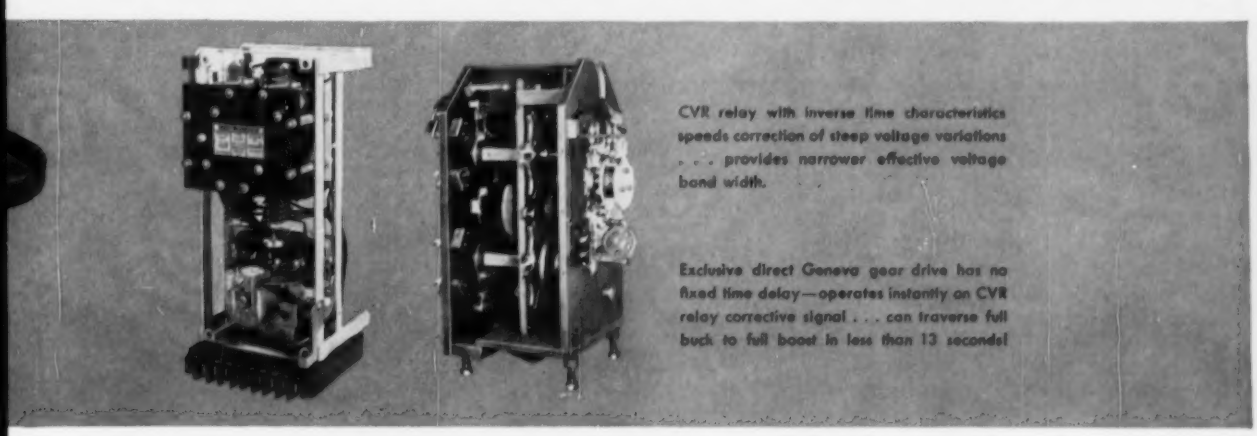
Because of direct Geneva gear drive there is no fixed time delay between relay and tap-changer operation. Tap changer operates instantly . . . can traverse full buck to full boost in less than 13 seconds!

3. 16-STEP REGULATION

The exclusive URL-16 with 1½-volt steps corrects exactly to balance voltage on a 3-volt bandwidth bringing the effective voltage nearer to this level. Similarly, the higher correction on 2-volt or greater bandwidth results in effective voltage closer to the desired level. URL-16 slashes number of corrective operations by 42%, contacts erosion 15%. Result—substantial savings in maintenance.

A narrower effective bandwidth means you can put more load on your system . . . get more revenue for power delivered. Specify new Westinghouse URL-16 regulators on your system. J-70779-X




CVR relay with inverse time characteristics speeds correction of steep voltage variations . . . provides narrower effective voltage band width.
Exclusive direct Geneva gear drive has no fixed time delay—operates instantly on CVR relay corrective signal . . . can traverse full buck to full boost in less than 13 seconds!

WATCH WESTINGHOUSE!

*WHERE **BIG** THINGS ARE HAPPENING FOR **YOU!***

Crowd gathers to see who won as Clark Chamberlain (left) draws the lucky tickets. Again this year San Diego's selling show . . .

Brought Sales and Prospects

Since they were started in 1933, San Diego Bureau of Home Appliance shows have been getting bigger every year. Attendance at the fall event, Nov. 23-29, was 190,000—up 5,000 from last year's high. Starting with a big attendance on the traditional Friday - after - Thanksgiving opening, crowds built up to a Sunday record that overflowed Balboa Park auditorium.

The manufacturers and distributors who put in the exhibits were more than satisfied and so were the dealers who helped man the booths and pocketed long prospect lists. Talks with them led to the conclusion that it was a better show than last year's in every way—in interest as well as attendance.

Designed to sell, San Diego's fall and spring shows are admission free. That follows the thinking of Clark Chamberlain, bureau secretary-manager and the man behind the shows' growth to national prominence.

On Sunday, everybody conceded, there was no chance to sell—the auditorium was too packed. On other days, however, from 1 to 10:30 p.m., people were looking seriously, were placing orders or asking for home demonstrations. One distributor made his expenses opening night. A saleswoman reported that she had made 10 home appointments in the first 2½ hours and had closed one sale by 7:30 p.m. And these were not isolated experiences. Almost every exhibitor made similar reports.

People attending the show were intelligent, they really wanted to know about the products, one distributor commented. When they accepted literature, they carried it away. There was no litter on the floor.

Big drawing cards were the electronic ovens, which were shown in three booths. And even these big-ticket

Everybody wanted to know about electronic ovens. Left, C. W. Shafer, Distributors Inc., spelled Home Economist Nancy Johnson in showing the new Westinghouse model; center, E. A. Scott Jr., Tappan, showed a built-in between electronic oven demonstrations; right, Mary Gammon, Kelvinator home economist, was assisted by Aileen Yeargen, the laundry equipment demonstrator

In the Wesix booth, Reid Prince talks to a customer while Wesley Hicks Jr. works at the back of the exhibit. Beyond can be seen

a section of the General Electric display of appliances and TV. G-E's small appliance booth (right) was manned by Roy Weldon

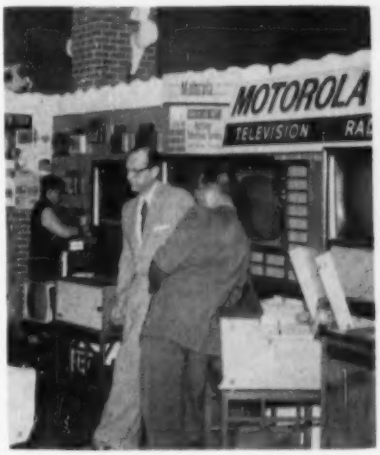
items were selling. Reflecting public interest in complete kitchens, the Westinghouse Confection kitchens proved as popular in San Diego as they had at San Francisco earlier in the year.

Table Devices Pulled

Small appliances, too, got good attention, as did TV.

Hoffman had a stopper in its Semiconductor Division exhibit, "Harnessing the sun with silicone solar cells," and Hotpoint drew them in with a portable TV drawing.

Every display was well set up and well attended. The pictures on these pages were purposely taken during a slack period. At other times, appliances could not be seen for the crowds.



Ed Nystrom, Nystrom Bros., bureau president this year, showed the Motorola line

Betty Stalker, Maytag West Coast, demonstrates cold water wash in new automatic

In the Norge booth, left to right: Luci LaFontaine and Miles H. Houch of Calgon, Earl Estes, Merchandising Distributors, Cassie Wilson, H. L. Benbouth, Fran Osborne, Monsanto Chemical. The

Sheer Look was demonstrated by R. W. Payne, Frigidaire Sales Corp. (second from right), and Paul V. Lupka, Refrigeration Equipment Co. Square corners and charcoal grey got attention

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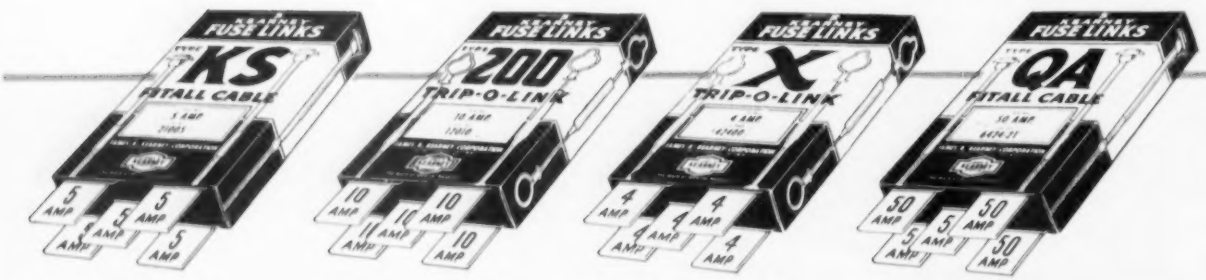

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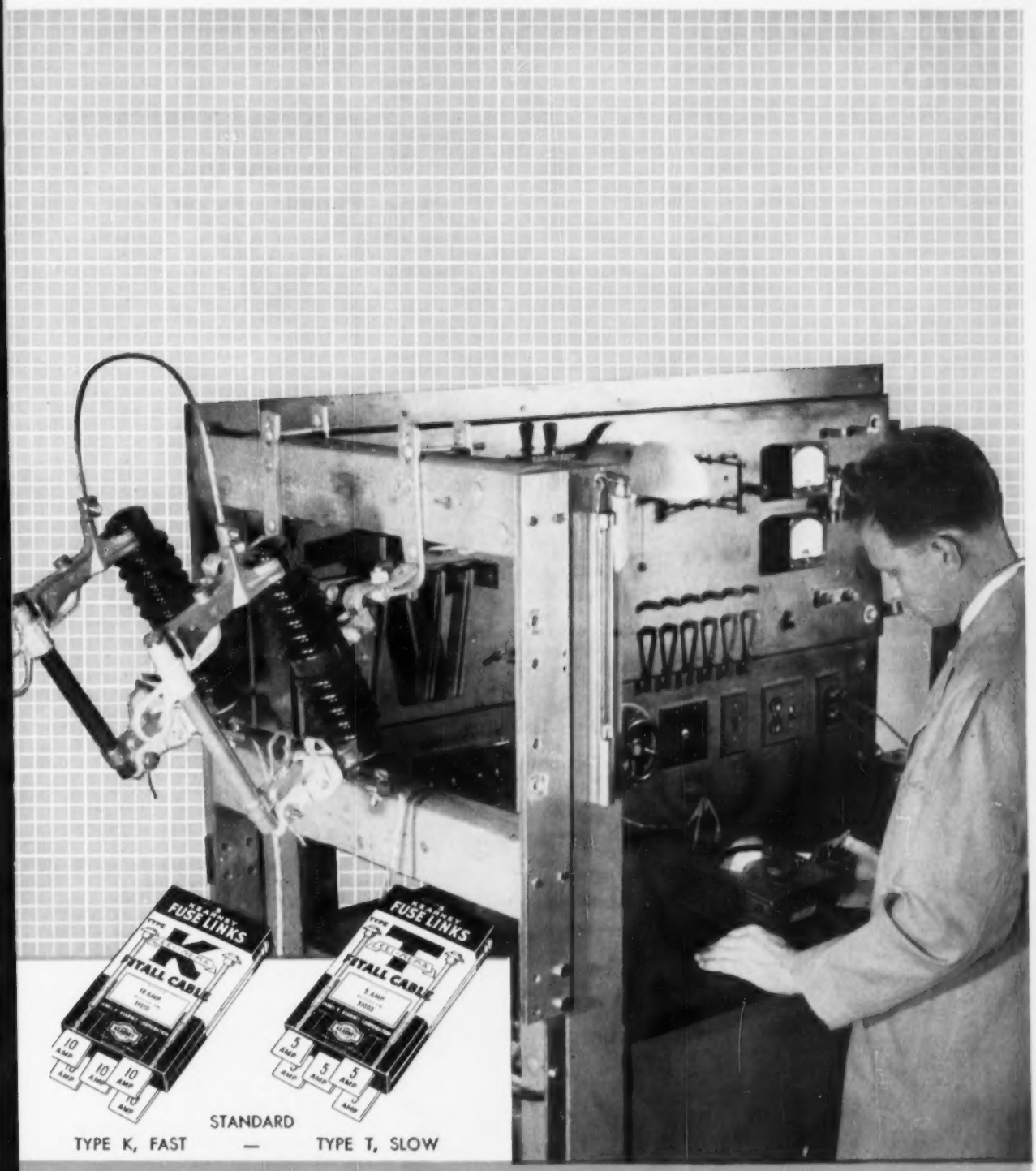

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THIS MONTH'S NEWS

Partnership Gets Credit For Power Supply Relief

Cooperation of utilities and the federal government is credited with pushing the anticipated 1961-62 power shortage in the Pacific Northwest back three years, according to William A. Pearl, Bonneville Power Administration head.

At the time of the BPA annual forecast a year ago, new, nonfederal generation scheduled through 1965 amounted to 252,000 kw, and in this year's forecast nonfederal projects scheduled or licensed total 1,457,000 kw.

According to Pearl, the new look in the Pacific Northwest is that 1965 will see power to meet all firm and interruptible loads in Oregon, Washington, northern Idaho and western Montana under median water conditions. This will be true, he reports, despite the heavy increases in loads forecast for the region.

Construction under way on federal projects will provide 2,299,250 kw of new capacity by December 1961. Other utilities have 4,147,400 kw under construction or licensed before 1965. This added to the present capability will bring the total for the region to 14,892,380 kw.

The forecast states that loads are growing at a rate that will absorb all of the 14,892,380 kw and require additional power resources by 1964-65. In the report is a statement that "after the utilization of economical hydro, the region will turn to conventional steam plants and later nuclear plants to supply the ever-growing power needs."

Core Drilling Starts On Green River Project

First-stage core drilling for another possible site for the Green River multipurpose project on the Middle Santiam River of Oregon's Willamette Valley has been completed by the Corps of Engineers.

The work, first begun in 1949 when the 19-dam Willamette Valley project was revived after the war, indicates four alternate sites in the five miles of canyon on the river above the confluence with the South Santiam.

Plans for a seven-story, $2,100,000 addition to the Seattle City Light building have been approved by the Seattle Board of Public Works. Weight will be held to a minimum so the bearing strength of existing foundations will be adequate. Paul J. Raver, superintendent, said the new building will be the "best lighted building . . . in the country"

Southwest Utilities Planning Power Pool

Plans for formation of a power pool and cooperative construction of a power plant that will eventually hold units built by California Electric Power Co., Arizona Public Service Co., and the El Centro, Calif., Imperial Irrigation District are announced.

Calectric will install the first 80,000-kw unit in the Yuma Axis steam plant, near Yuma, Ariz., starting next year for completion in the spring of 1959. Public Service will add the second 80,000-kw unit, expected to go on the line in 1962. The third will be built by the Imperial Irrigation District in 1963 or 1964.

Bechtel Corp. has been awarded the contract to build the first two units, at a cost of $23,000,000. The three-way agreement contemplates expenditure of $50,000,000 for power facilities during the term of the contracts.

The interconnected system will include all the territory and loads served by the territory of the district, the Yuma area of Public Service and the Palo Verde and Mexicali loads of Calectric.

The plant will be operated by Public Service and the three contracting agencies will participate in the plant output and will share all costs on the basis of participation.

Bureau of Reclamation lines will be interconnected with the pool.

Big Construction Budget Announced in Colorado

Public Service Co. of Colorado announced it will spend $33,500,000 on construction in 1957. This is in addition to $110,000,000 spent for expansion during the past five years.

J. E. Loiseau, president and general manager, said the 1957 construction program tops the 1956 record by $5,500,000.

The largest of the capital additions in the 1957 budget is $11,219,000 for continuation of construction of two new power plants—the Cherokee at Denver and the Cameo at Grand Junction.

These plants are due to begin operating in the summer of 1957 and will increase the company's electric generating capacity by 21% to 700,000 kw.

High Pleasant Valley Dam Wins Bureau Chief Favor

A proposed high dam at Pleasant Valley on the Snake River between Idaho and Oregon was mentioned favorably by Reclamation Commissioner W. A. Dexheimer at a convention of the Inland Empire Waterways Assn. in Yakima, Wash.

The Pacific Northwest Power Co., made up of four private utilities in the area, has applied to the Federal Power Commission for permission to build one low dam at Pleasant Valley and another downstream at Mountain Sheep. The Idaho Power Co. is building one low dam upstream at Brownlee and proposes to build two more between Pleasant Valley and Brownlee, at Hells Canyon and Oxbow.

"Our report indicates that a high dam at Pleasant Valley, backing water up to the Oxbow power plant, would provide an additional 1,300,000 acre-ft of flood control for the Columbia River system," said Dexheimer. "This would inundate the Hells Canyon site but provide more power than the combined low dam at Pleasant Valley and run-of-the-river power plant at Hells Canyon."

Dexheimer described a high dam at Pleasant Valley as "an entirely feasible project—regardless of who might build it." Public power groups oppose low dams at Pleasant Valley and Mountain Sheep, contending they would not provide full development of the river.

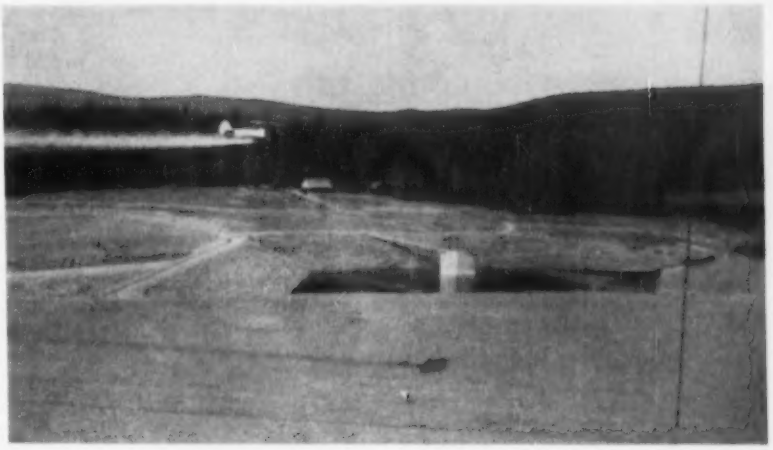
Klickitat PUD Cautions About John Day Project

Attitude of the new Congress toward hydroelectric development of the Pacific Northwest will influence decision of the Klickitat County PUD on sponsorship of the proposed John Day Dam on the Columbia River, the PUD has announced at Goldendale, Wash.

If the federal government agrees to sponsor the project, the PUD will drop out, said the PUD commissioners after analyzing election returns.

"We are in the situation of having almost an entire delegation from the Pacific Northwest committed to a strictly federal development," said the commissioners. "On the other hand, we returned to office a national administration committed to a partnership program. It now puts us in the position of probably having to wait to see what direction the power program will take."

The commissioners admitted that the sharp rise in interest rates had dulled their enthusiasm about the project.



Planting grass on a barren area around Portland General Electric's Timothy Lake Dam reservoir was quickly and economically accomplished by using an airplane. Planting cost was 75c an acre, and dusting with fertilizer cost $1.50 an acre, not including materials. The reservoir area is being planted with trees, too, for erosion protection and beauty

Oregon Utilities Ask For Relocation Money

Utilities of Oregon have served notice on the Oregon Highway Commission they hope federal highway construction funds will be available to compensate for relocations of lines caused by the new federal-state program.

Historically, Oregon public and investor-owned utilities having free use of state-owned rights-of-way along highways have paid for relocating their facilities when routes are widened or rebuilt. A provision in the federal aid program, permitting use of federal share funds for reimbursement to the state for utility relocation, is involved. The federal statute says reimbursement for such relocations paid for by the state may be taken from the federal funds if this is legal in the state. In Oregon, according to belief of state highway legal aides, the payments would be illegal.

Francis Hill, attorney for electric and gas utilities of Oregon, informed the commission an effort would be made in the legislature to legalize such arrangements. He said 42 other states were similarly involved in legal doubts. Hill was principal spokesman for investor-owned utilities. Others appeared in behalf of utility districts and REA cooperatives.

While Commission Chairman B. R. Chandler agreed to confer with the utilities' representatives again, Commissioner Charles Reynolds declared any funds used in such manner would reduce amounts actually spent on road programs.

On hand for utilities were Larry Bauer, Newport, manager of the Central Lincoln County PUD; Lee Wooden, leader of Oregon REAs; Edward Branchfield, attorney for California-Oregon Power Co.

Rocky Reach Financing Costing Close to 5%

Chelan County PUD of Wenatchee, Wash., finally has been able to arrange financing of first-stage construction of Rocky Reach Dam on the Columbia River, but only by agreeing to pay an effective interest rate of 4.91% for a $23,100,000 bond issue.

"Financing of stage one of Rocky Reach has been difficult due to rising interest rates and heavy demands on the existing pools of capital," said L. J. Richardson, president of the PUD commissioners. "However, we feel that this is the time for the project to go ahead and get more kilowatts for the region to meet the oncoming demand."

Referring to Puget Sound Power & Light Co., which has an option to buy up to half of the 700,000 kw to be produced, Richardson declared that "the PUD and Puget Power have worked diligently in an effort to obtain financing so the project can move ahead. Everyone has reached an accord resulting in the bond offer."

• **Proposed construction** of a hydroelectric dam on the Copper River in Alaska has met with opposition from the Alaska Native Service. The Central Alaska Power Assn. has applied to the Bureau of Reclamation for permission to build a dam which would develop 12,000 kw of power. The Alaska Native Service says the dam would flood the village of Chitina.

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Record Christmas Airlift sent this Petersen Engineering Co. tension stringer from Santa Clara, Calif., to Day & Zimmerman Inc. in Philadelphia, Pa. Although not the heaviest (4½ tons) load flown by Flying Tiger, it was the largest physical-sized unit ever airlifted by the line—not to mention a reversal for the usual East-West traffic flow

Cowlitz County PUD Signs Swift Contract

The Cowlitz County PUD of Longview, Wash., has become the third party with the Pacific Power & Light Co. and the Bechtel Corp. in a contract covering engineering work on the Swift No. 2 hydroelectric project.

The agreement became effective when the Federal Power Commission granted the PUD a license to construct the project. The Swift No. 2 project covers a second power house 3½ miles downstream from the main Swift Creek Dam and power house on the Lewis River. It is estimated to cost $16,000,000 and to produce 67,500 kw.

North Platte Water Allotted to PP&L

The Wyoming water board of control has granted Pacific Power & Light Co. preferred use of 2.7 sec-ft of water in North Platte River to enable the firm to operate the steam power plant it is constructing near Glenrock, Wyo.

Deputy State Engineer Earl Lloyd said PP&L would divert considerably more water from the river for operation of the 100,000-kw plant, but most of it would be returned to the river.

He said the 2.7 sec-ft would take care of the consumptive use of the power plant.

New Power Pool Pays In First Two Months

In less than two months of operation the Puget Sound-Cascade Power Pool saved not only 13,000,000 kwh of power, which otherwise would not have been fully utilized, but made better use of a vital area resource—water—according to Dean Barline, Tacoma director of utilities and chairman of the Puget Sound Utilities Council.

"The savings already are more than ten times the cost of operating the power pool for an entire year," Barline declared. "We're getting a power bonus that has dollars and cents value to all the people of the Puget Sound-Cascade area."

In giving case histories of specific power-saving interchanges since the pool was formed Sept. 5, Barline emphasized that the new pooling arrangement is resulting in more effective use of the area's storage reservoirs and of river flow.

The pool's coordinator-dispatcher, located in Seattle, is in 24-hour communication by private wire with the load dispatchers of each of the four utilities, Seattle City Light, Chelan PUD, Tacoma City Light and Puget Sound Power & Light Co.

Keeping close watch on the operation of all participating utilities hour by hour, and of the operation of the larger Northwest Power Pool, the co-

ordinator is able to direct exchange of power between the members for maximum benefit.

"How to sell a cloudburst" could be the title of one of the case history reports given by the council to point up dramatically how the Puget Sound-Cascade Power Pool works.

On Sept. 24-25 heavy rains above Seattle City Light's Ross and Diablo Dams increased stream flows in excess of the system's demands. Arrangements were made by the pool's coordinator so that power which otherwise would have been "water over the dam" was wheeled over the transmission lines of two members—Puget Sound Power and Chelan PUD—to eastern Washington utilities. They, in turn, were able to reduce their generation, and to store water needed for critical winter months in Grand Coulee reservoir and in Montana's Flathead Lake.

Within the two-day period nearly 1,000,000 kwh of energy which otherwise would have gone unused was saved, and Seattle City Light earned additional revenue.

In another case, through the cooperation of the U. S. Army Engineers, stream flow at the Chief Joseph Dam on the Columbia was adjusted to enable the Chelan PUD's downstream Rock Island generators to produce up to 150,000 kwh additional daily during the two-month period. This extra power—worth approximately $35,000—helped member utilities meet current demands, while conserving their other resources for future use.

British Columbia Job To Begin Next Spring

The British Columbia Power Commission will begin work early next spring on a new top-priority, $20,000,000 hydroelectric project on Vancouver Island designed to provide more power for the booming Alberni Valley by the autumn of 1958.

First stage of the project—the $10,000,000 Ash River development—has been given the green light by the government, and two years from now it should be producing 26,250 kw for the area's needs.

The over-all Alberni Valley project will produce a combined output of 65,625 kw. The two stages that will follow Ash River are the Stamp River and Sproat River projects.

• **A seventh** 64,000-kw generator has been put in operation at Chief Joseph Dam by the Corps of Engineers, bringing total installed capacity to 448,000 kw. Nine more generators are scheduled for installation.

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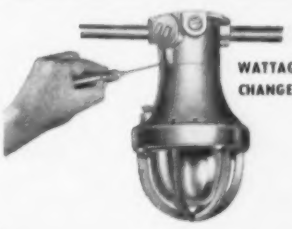

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GREATER SUSTAINED ACCURACY

New test data on meter performance, compiled in G-E research laboratories, prove that General Electric's revolutionary "floating disc" meter provides high sustained accuracy which saves you money.

During accelerated life tests, identical loads were applied to the G-E I-55 meter and to meters with conventional bearing systems. The results are startling.

Here's the proof. Assume an average

GREATLY REDUCED TILT ERROR LOSSES

Any meter operating at even a slight tilt will give inaccurate readings that often result in loss of revenue. General Electric lab tests prove that I-55 meters with magnetic suspension "floating discs" are least affected by tilt—while the accuracy of meters with conventional ball bearing systems varies considerably with different angles of tilt.

Here's the proof. A conventional meter at one degree forward tilt, operating at a continuous average of 240 volts, 1.5 amperes, would lose .01728 kwhrs

NO PERIODIC BEARING REPLACEMENT

For complete details on how I-55 meters can save you money, call your nearby G-E Apparatus Sales Office. For information on the complete line of General Electric watthour meters, write Section 621-10, General Electric Co., Schenectady 5, N. Y.

TOTAL FIFTEEN-YEAR

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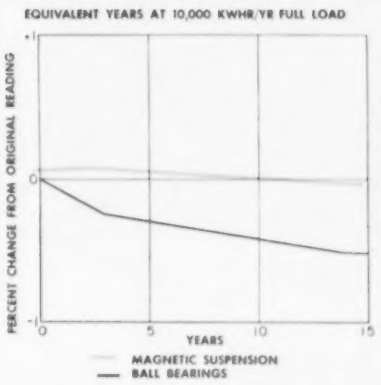
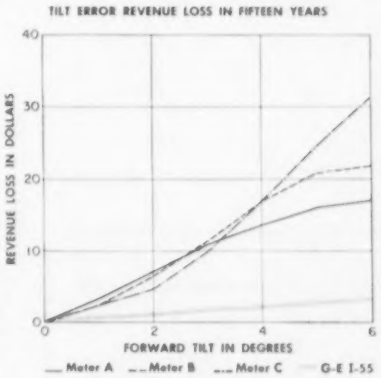
SAVED IN JUST 15 YEARS

kwhr usage per consumer (based on ***Electrical World*** forecasts) per year for fifteen years and the per cent loss on registration per year—the total loss in kwhrs would be 266.8 for a conventional meter. At two cents per kwhr, this means a gross loss of $5.34. By considering the "present worth" factor at 6 per cent interest for each year, the net loss on a conventional meter would be $3.14. The I-55 eliminates this loss and saves you the money.



$3.14

registration over the I-55 in 24 hours. In 15 years, the kwhr loss would be an amazing 94.40 kwhrs. Taking a reasonable figure of two cents per kwhr, the gross loss would be $1.89. By considering the "present worth" factor at 6 per cent interest for each of the fifteen years, the conservative saving realized by using a General Electric I-55 meter would be $1.29. And a glance at the chart on the right reveals much higher savings at tilt errors of 2 degrees to 6 degrees.



1.29

The trouble and expense of periodic bearing replacement is eliminated when you use General Electric I-55 meters with the "floating disc."

General Electric accelerated life tests prove that ball bearings in ordinary meters must be inspected and in many cases replaced after a comparatively short period of time. The G-E I-55 meter with magnetic suspension—and no bearings—showed no measurable wear even after the equivalent of more than 300 years of normal operation.

Bearing replacement is costly. Here's a typical example. Assuming replacement occurs after fifteen years' service, and taking into account an estimated average replacement cost and the "present worth" factor at 6 per cent interest, a conservative cost for bearing replacement on each conventional meter would be 34 cents. With no bearings to replace on the I-55 you save 34 cents on every meter.

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NEWS ABOUT PEOPLE

Davenport

• **James F. Davenport,** vice-president and general manager of Southern California Edison Co., has been elected executive vice-president of the company. He recently returned from Geneva, Switzerland, where he was U.S. delegate to the 1956 session of the Committee on Electric Power. He has been with Edison since 1926.

• **James Dunstan,** hydraulic and civil engineer of Renton, Wash., has been named superintendent of utilities for the city. He was formerly city engineer of Wenatchee, Wash.

• **A. Norman Murray** has been appointed assistant regional director of Region 2, Bureau of Reclamation, to succeed Robert S. Calland, who retired. The regional headquarters are at Sacramento, Calif. Murray is a graduate of Washington State College and has been with the bureau since 1939.

• **H. Banks Kinnison** is new branch area chief for Western states in a reorganization of the water resources division of the U. S. Geological Survey. He will headquarter at Menlo Park, Calif.

• **Douglas S. Aiken** is new manager of the Central district of Pacific Gas and Electric's East Bay division. His former position as division commercial sales manager will be filled by **Carl C. Mak,** who moves up from manager of the Bay district. **Gerald C. Stanley** assumes Mak's former position.

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from

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Manufacturers' Representatives in Electrical, Electronic, Aircraft, Plastics and Marine Lines.

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Telephone EMerson 9-1226

Attention. Please note corrections and additions to the November 1957 edition Manufacturers' Directory on page 140 this issue.

Machen

General Superintendent Named by Pacific G and E

C. R. Machen is new general superintendent of Pacific Gas and Electric's more than 67,000 miles of power lines in northern and central California.

He joined the company in 1927 while still a student electrical engineer at the University of California and most of his career has been spent in the East Bay division. He became division electric superintendent at Chico in 1949, but returned to head the East Bay electric department in 1952.

Machen's successor as East Bay electric superintendent is William T. Hannum, former North Bay division superintendent. He has been with the company since 1920.

• **Harry S. Petersen** has been promoted to director of personnel and public relations for Black Hills Power & Light Co. at Rapid City, S. D. He joined the firm Jan. 1, 1953, as publicity director after more than 10 years with South Dakota radio stations. He is a former vice-president of Black Hills Broadcast Co.

• **Mrs. R. H. Kelley**—known as "Nellie" to everyone in Edgemont, S. D.—has retired after more than 30 years of service with Black Hills Power & Light and its predecessor companies. She was honored at a dinner attended by company officials from Rapid City, including Neil Simpson, vice-president.

• **Arthur L. Mitchell** has assumed his new duties with Region 3 of the Bureau of Reclamation as chief of the river control division of the region. He transfers to Boulder City from Denver. He succeeds **John Stanley** who resigned to accept an engineering position with a private firm in Iraq.

Nicopress

The Tool and the Sleeve

that are made to work together

together they make the perfect splice

Nicopress Sleeves and Tools Patented in U. S. and Foreign Countries. "Nicopress" Registered in U. S. and Foreign Countries.

The National Telephone Supply Company

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Canadian Mfr.—N. SLATER CO., LTD., HAMILTON, ONT., CANADA

Export Distributor—INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

THE NATIONAL TELEPHONE SUPPLY COMPANY

Utilities can save up to 75% in soundproofing

with new Westinghouse power transformers

Westinghouse announces drastic reduction in premium costs paid for transformers with lower than standard sound levels. Extensive improvements in manufacture and application of materials have created spectacular new performance available to all users of Westinghouse power transformers. Noise levels can now be reduced for much less cost.

Westinghouse power transformers—already smaller and lighter per kva than transformers of any other design or manufacture—will achieve lower sound levels and promise to show even greater advantage in weight and size comparisons. Here is new performance available for all new purchases of Westinghouse transformers—501 kva up to the world's highest capacity three-phase units.

So here's new help—especially in planning substations where increasing population densities are making transformer noise a real problem. This is welcome news, too, for noise-sensitive areas such as schools and hospitals. In addition to investment savings and improved public relations, consider the advantages of new flexibility in interchange of equipment, and new ease in obtaining rights of way and substation sites.

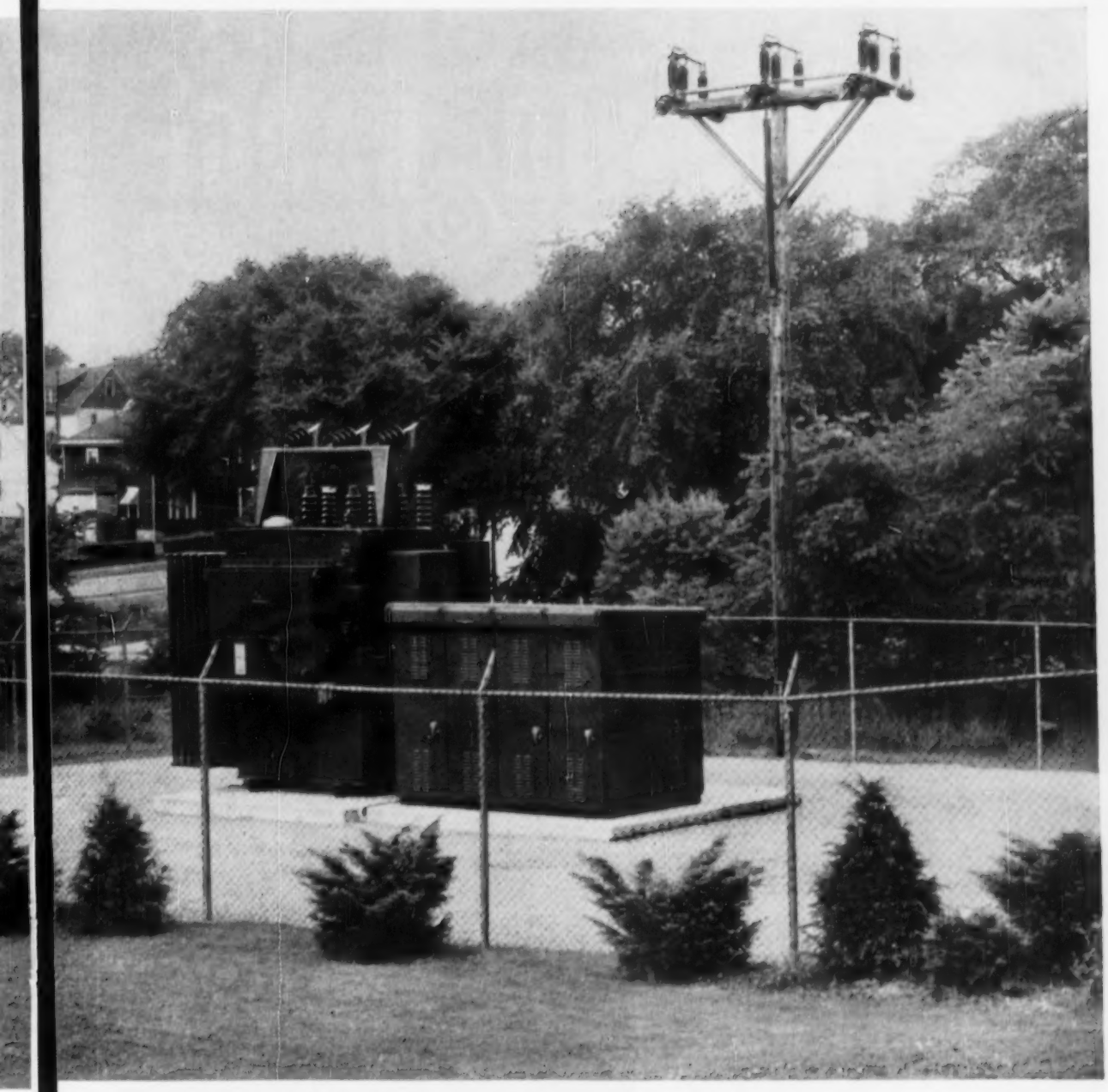
Anticipated power transformer purchases over the next five years total 300,000,000 kva. Based on this figure, reduction in soundproofing "extras" can reach $30,000,000. This is the performance Westinghouse can deliver—with all new power transformers.

For the full story, call your Westinghouse representative or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-70785

Westinghouse now offers you a $11,730 saving on equipment ordinarily invested to cut transformer noise at a typical 10,000 kva neighborhood substation such as this . . . a saving equal to 25% of total equipment cost.

YOU CAN BE SURE...IF IT'S

Westinghouse®



RECOMMENDED NEMA SOUND LEVEL DB.	PER CENT PRICE ADDITIONS FOR REDUCTION IN RECOMMENDED NEMA SOUND LEVEL OF									
	3 DB.		6 DB.		9 DB.		12 DB.		15 DB.	
	OLD	NEW	OLD	NEW	OLD	NEW	OLD	NEW	OLD	NEW
56 to 60	22	6	41	9	—	—	—	—	—	—
61 to 65	14	5	25	7	55	14	—	—	—	—
66 to 70	8	4	15	5	35	10	—	—	—	—
71 to 75	4.5	3	9	4	20	7	35	14	—	—
76 to 80	2.5	2	5.5	3	11	5	19	10	39	20
81 to 85	2	1	3.5	2	6	3	12	6	23	12
86 to 95	—	1	—	1	—	2	—	4	—	8

Drastic reductions in sound levels offered with all new Westinghouse Transformers make possible the above reduction in premiums previously necessary to achieve these same levels.

FOR BETTER ELECTRICAL INSTALLATIONS

5 NE WIDE RANGE CONNECTORS

are all you need

For Wire and Cable Sizes 14 AWG to 500 MCM

100% COPPER FOR CONDUCTIVITY

STEEL FOR PRESSURE

Entire Unit Cadmium plated—for copper, aluminum or steel conductors

LISTED BY UNDERWRITERS' LABORATORIES, INC.

Catalog Number	Cable Size Range	
	Minimum	Maximum
NE 35	14 Sol.	8 Str.
NE 60	8 Sol.	2 Str.
NE 100	2 Str.	1/0
NE 200	2/0	4/0
NE 400	250 MCM	500 MCM

- **Positive Grip Action**—Screw pressure on contact pad perfects pressure contact—is self-locking—increases "pull out" resistance.
- **Low Temperature Rise**—High pressure and wide contact area provide electrical conductivity greater than that of the maximum size wire or cable the connector will take.
- **Economical**—"Wide Range" provides for maximum usage, low inventory—completely salvable—one-piece assembly.

Write for our folder giving dimensional details, catalog numbers and other helpful information on National Electric "Wide Range" Connectors.

National Electric Products

NATIONAL ELECTRIC PRODUCTS NE WIRING SYSTEMS

PITTSBURGH, PA.
2 Plants • 11 Warehouses • 35 Sales Offices

Hoover

Johnston

Hoover Is Promoted As Dave Johnston Retires

W. D. "Dave" Johnston has announced his retirement as vice-president of Pacific Power & Light Co. and manager of the Wyoming division. His successor is Veryl Hoover.

Johnston will continue as a member of the PP&L board of directors and will have an advisory position with the Wyoming division. He is rounding off 36 years of electric utility service that included pioneering for the industry in Wyoming.

During his career, he worked with Telluride Power Co., was general supervisor of Natrona Power Co., vice-president and division manager of Mountain States Power Co., and then to his PP&L position.

Hoover is a veteran of PP&L service, too, after serving 29 years with Mountain States and PP&L. He has been serving as assistant to Johnston since the PP&L-Mountain States merger in 1955.

Montana Power Reports Three Personnel Moves

Montana Power Co. has announced one retirement and two promotions in recent weeks.

George Nelson, purchasing agent since 1942, retired Jan. 1 at his own request after serving in the purchasing department since 1925. New manager of the purchasing department is Roger A. Hofacker, an employee of the utility since 1939 when he graduated from Montana State College.

Promoted, too, is John W. Cromer, also a graduate of Montana State College, who moves up from distribution engineer to assistant superintendent of transmission and distribution.

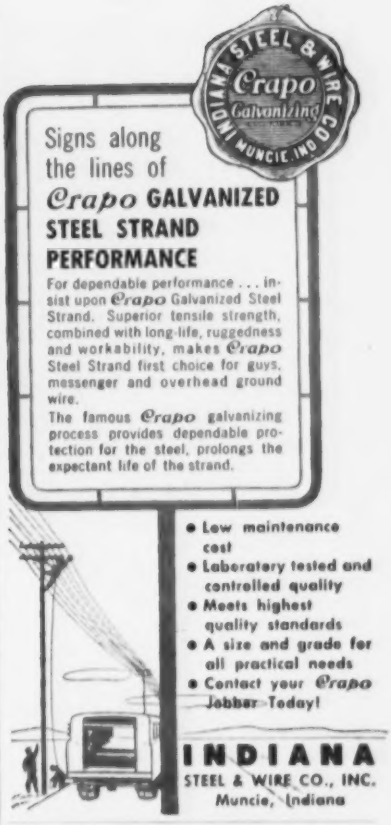
J. E. Corette, president and general manager of the company, commenting on Nelson's retirement, said:

"We appreciate the service George Nelson has given Montana Power and accept with regret his application for early retirement."

• **Thomas J. Lovell,** supervisory electrical engineer in the Bureau of Reclamation's engineering offices in Denver, is retiring after nearly 25 years of government service. He was twice employed by Southern California Edison Co. during his career, once from 1913 to 1918 and again from 1920 to 1933. He has been head of the bureau's power system technical section since 1954. He has held successive supervisory positions in the design of major electrical equipment for Hoover, Shasta, Keswick and Grand Coulee power plants.

• **John H. Mack** and **Stephen C. DeMers** have been selected by Montana Power Co. to head up two new departments in the company. Mack is manager of the claims department and DeMers is manager of the land and right-of-way department. Mack has been with the company 19 years, serving in accounting and statistical capacities and as claim agent. DeMers joined the company in 1939.

• **Howard Tyler** has been named superintendent of Salt River Power District's Agua Fria steam-electric generating station.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MUNCIE, IND.
Signs along the lines of Crapo GALVANIZED STEEL STRAND PERFORMANCE
For dependable performance . . . insist upon Crapo Galvanized Steel Strand. Superior tensile strength, combined with long-life, ruggedness and workability, makes Crapo Steel Strand first choice for guys, messenger and overhead ground wire.
The famous Crapo galvanizing process provides dependable protection for the steel, prolongs the expectant life of the strand.
• Low maintenance cost
• Laboratory tested and controlled quality
• Meets highest quality standards
• A size and grade for all practical needs
• Contact your Crapo Jobber Today!
INDIANA
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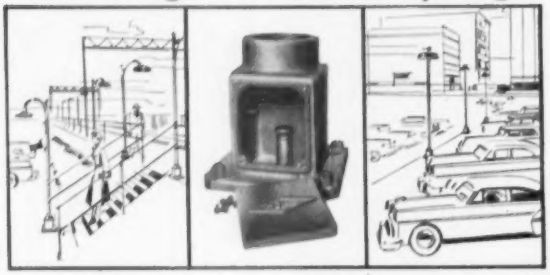
Muncie, Indiana

NEW LOW-COST TERMINAL
UL
type KA
BURNDY
KA-LUG
• STRONG — high-strength copper alloy.
• VERSATILE — five KA-LUG sizes accommodate #14 Solid thru 500 Mcm.
• COMPACT — permits easy terminating in confined areas.
• EASY TO INSTALL — a screwdriver for the smaller sizes; an Allen wrench for the larger size KA-LUGS.
For further information contact:
GEO. E. HONN CO.
420 Market Street
San Francisco 11, Calif.
Tel.: SUtter 1-7353

A rigid support for cut-to-length pipe
A watertight chamber for splicing



COMBINED IN THE NEW HOPE METAL-PIPE BASE for your outdoor lighting jobs! Cut Standard pipe to length—thread it to fit the Hope Metal-Pipe Base and to take the lighting fixture—and you have a complete custom-made, low-cost lighting standard. Buy the components through your electrical wholesaler—assemble them yourself—install the standards for signs, signals, platforms and plant lighting jobs. Bases made for 2", 2½", 3" and 4" pipe sizes. See your wholesaler —or write us direct.

2" — H 42200
2½" — H 42250
3" — H 42300
4" — H 42400

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RUBBER • NEOPRENE • PLASTIC
Flexible Cords

In convenient lengths on smart lithographed metal spools for fast over-counter action. For absolute uniformity, superior electrical qualities and ultimate economy, sell 'em CORNISH . . . the BEST!

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CORD SETS

For home, farm and industry now available in COLOR. Engineered and produced in modern plants . . . the BLUE CHIPS of industry, worth a push for PROFIT.

CORNISH WIRE CO., INC.
50 Church Street New York 7, N. Y.

DIRECTORY ADDITIONS

HARVEY HUBBELL, INC., State & Bostwick, Bridgeport, Conn.—Grover A. Anderson, 1675 Hudson Ave., San Francisco 24; A. M. McMillan, 103 N. Santa Fe Ave., Los Angeles 12.

CRYSTALHEAT CO., 14761 Keswick St., Van Nuys, Calif.—Representatives: Wm. Proby & Associates, 2915 13th Ave., S.W. Seattle and 1308 N.W. Everett St., Portland; American Electric Heating & Air Conditioning Corp., 9761 Wilshire Blvd., Beverly Hills, Calif.

SUPERIOR ELECTRIC CO., 83 Laurel St., Bristol, Conn.—Branch offices: 14663 Titus St., Van Nuys, Calif.; 2881 El Camino Real, Redwood City, Calif.; 810 3rd Ave., Seattle 4, Wash.

UTILITY APPLIANCE CO., 4851 S. Alameda St., Los Angeles, Calif.—Wm. Dozier, 10669 N.E. Oregon St., Portland, Ore.; Herman Wertheimer, 1802 W. Hazelwood, Phoenix.

ELECTRICAL SPECIALTY CO., 2026 Arapahoe St., Denver, Colo.

OHIO BRASS CO., Mansfield, Ohio—Add to Where-to-Buy product listings Ohio Brass Co. under Arresters, Lightning; Bushings; Insulators, Porcelain; Fittings, Insulators.

SORGEL ELECTRIC CO., 833 W. National Ave., Milwaukee 4, Wis.—Fred W. Carlson & Associates, 935 N.W. 12th Ave., Room 133, Portland, Ore.

Three Pacific Veterans Retire From Service

Pacific Power & Light Co., announces the retirement of Albert E. Brown, chief engineer of the Laramie power plant since 1929 and a 36-year veteran. He was with Western Public Service Co. when he first started working at the plant.

Frank C. Freeland, system dispatcher in Portland since 1950, retires after 33 years.

W. L. Fitzpatrick, assistant secretary of the company, has retired after 44 years with Mountain States Power Co. and PP&L. He is mayor of Albany, Ore.

• **James T. Davidson** has been named central division office manager of the Puget Sound Power & Light Co. in Seattle. He succeeds **George Westerland,** who is retiring with a record of 34 years with the company. **Harry Klein** will succeed Davidson as Bremerton office manager.

• **Morley H. Fox** has been appointed manager of the new labor relations department of British Columbia Electric Co. at Vancouver. He has been with the company since 1936 and was formerly supervisor of salary standards and employee services.

Deaths

Merrill

Pacific Power & Light's Zadoc E. Merrill Dies

Zadoc E. Merrill, 75, chairman of the board of Pacific Power & Light Co., since 1954, died at his Albany,

Ore., home after an illness of three years. He was formerly chairman of the board of Mountain States Power Company.

"Zed" Merrill spent half a century in association with the Pacific Northwest investor-owned electric utility industry, starting with a job as a draftsman with Washington Water Power in 1906.

He joined Mountain States in 1923 as assistant general manager and was elected vice-president in 1932 and to the board of directors in 1936.

• **Samuel G. Hepler,** 77, retired Seattle electrical contractor, died Nov. 16. Before his retirement in 1951, he was owner of Arrow Electric Co. and electrical contractor for a number of major Seattle buildings. He helped to organize the Washington Electric Club, was a former district vice-president of the National Electrical Contractors Assn., and was former chairman of the regional code committee of the electrical contracting division of the construction industry in the Pacific Northwest.

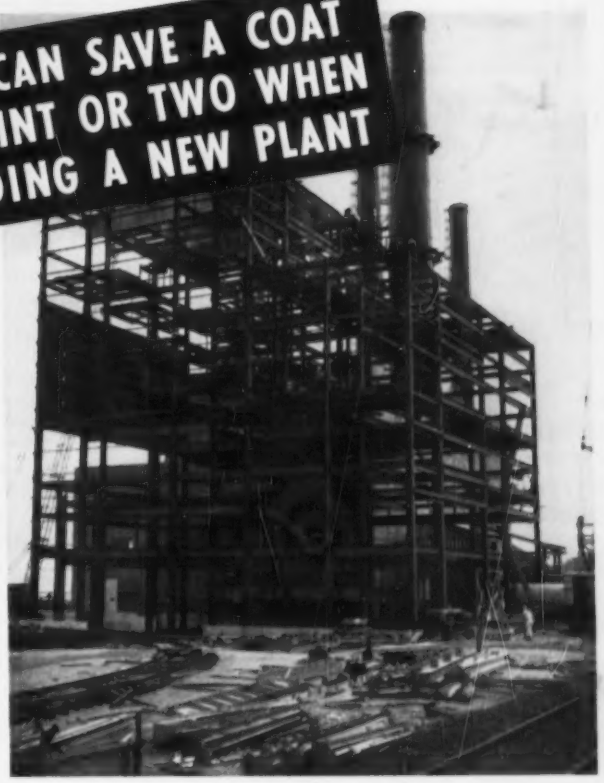
• **J. Raymond Murphy,** 62, district manager of General Electric's apparatus sales division at Seattle, died Nov. 21 on a train en route to Spokane. Graduated from Virginia Polytechnic Institute with both B.S. and M.S. degrees in electrical engineering, he joined G-E in 1916. In the years since, he served as manager of International G-E's electrical department in Manila, as assistant sales manager of the apparatus department in Seattle, manager of the Spokane office and then on a special assignment in Washington, D.C., during World War II. He had been district manager of apparatus sales since the end of the war.

• **W. H. Morrison,** 73, vice-president of Marshall-Wells Co., and veteran employee in Vancouver and Winnipeg, died at his Winnipeg home recently. Interment was at Vancouver.

• **Eugene North,** 60, retired superintendent of service and appliances for Puget Sound Power & Light Co., died Nov. 26 at Seattle. He had been operating an apartment house since his retirement in 1951.

• **William J. Dorrans,** 46, field sales manager of Curtis Lighting Inc., was fatally injured Nov. 8 when his plane crashed during an emergency landing near Taylor, Neb. He had been head of the national sales organization since July, 1955.

YOU CAN SAVE A COAT OF PAINT OR TWO WHEN BUILDING A NEW PLANT



Subox paints are based on suboxide of lead, a most effective anti-corrosive agent. They are the only paints made in America using this chemically-active, finely-dispersed pigment that spreads smoothly, evenly, thoroughly, adheres closely and endures for many years.

Very often two coats of Subox replace three coats of standard paints, and frequently, even one coat is sufficient, especially as Subox* and Subalox* come in many attractive colors and serve as primers as well as finishing coats, or can be applied over conventional primers.

For full information write for the brochure: *"Plan Painting of New Plants to Reduce Costs."*

Subox Inc.

Established 1924 *Trade Mark

18 Fairmont Plant, Hackensack, N. J.

See Catalogues in Sweet's Industrial and Engineering Files

One Fixture Cost . . . One Installation Cost
NEO-RAY
ROTO-STRIP
C.S.A. APPROVED Pat. Pend.
HIGHER PROFITS FOR YOU
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IDEAS
COMPLETE
FULL OF FACTS
HELPFUL
THE NEW CONCEPT IN ACCENT . . . DISPLAY LIGHTING
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WADSWORTH
New
"E-Z-RED" CIRCUIT BREAKERS
12 - 16 OR 20 BRANCH CIRCUITS
SINGLE AND/OR DOUBLE POLE
100 AMP.
FUSIBLE MAIN DISCONNECT
FOR "E-Z-RED" (15 TO 50 AMP.)
CIRCUIT BREAKER BRANCH CIRCUITS
The WADSWORTH ELECTRIC MFG. CO. INC.
Covington Kentucky
WRITE FOR FREE CATALOG

NOTES ON THE TRADE

• **Joseph Pellicano** has been appointed Oregon and southern Idaho sales representative for McPhilben Lighting Co. His address is 1126 S.W. Hume St., Portland 19.

• **Donald H. Tilson** has been named manager of Alcoa's Northwest operations to succeed **C. S. Thayer,** who retired. He assumes over-all responsibility for the company's smelting and fabricating operations at Vancouver and at Wenatchee, Wash. Thayer was with Alcoa more than 43 years, and in the Pacific Northwest since 1940. He was developer of the "Niagara type" pot, an aluminum reduction cell that pioneered many design features utilized in present high ampere capacity smelting units.

• **Nu-Lite** Corp., Newark, N. J., has opened a Western sales office and warehouse at 1133 Solano Ave., Albany, Calif. **R. C. Harris** is general manager of the new division. The company specializes in engineered and service lighting.

Demarest

• **David Demarest** Jr. has joined Petersen Engineering Co. as sales manager for the Santa Clara, Calif., manufacturing concern. Demarest leaves Aluminum Co. of America after seven years, most recently as a member of the San Francisco district sales office.

Hutchinson

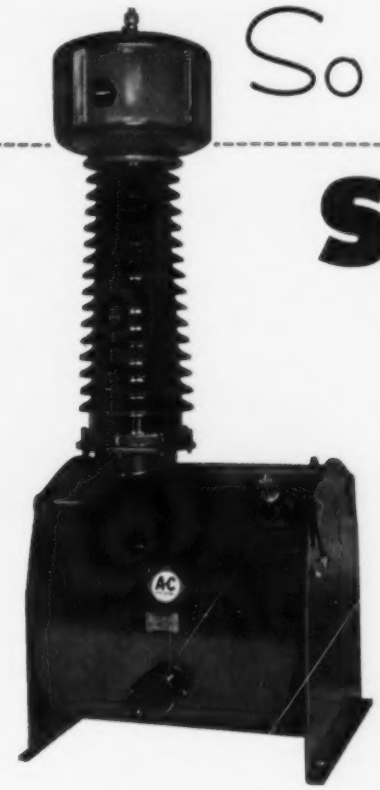
• **Robert Hutchinson,** former chief engineer for Federal Pacific Electric Co., has joined S&C Electric Co. to head up the new Western sales division, which includes the 11 Western states. He will headquarter in San Francisco.

• **George L. Draffan** has been elected to the new position of chairman of the board and chief executive officer of Ohio Brass Co. **Roger A. Black** succeeds Draffan as president and chief administrative officer.

• **Yale & Towne** Mfg. Co. has opened a sales and service subbranch in Fresno, Calif., for its industrial lift trucks. Located at 410 Broadway, the subbranch is under the direction of the San Francisco branch, and will be headed up by **W. J. Stroud.**

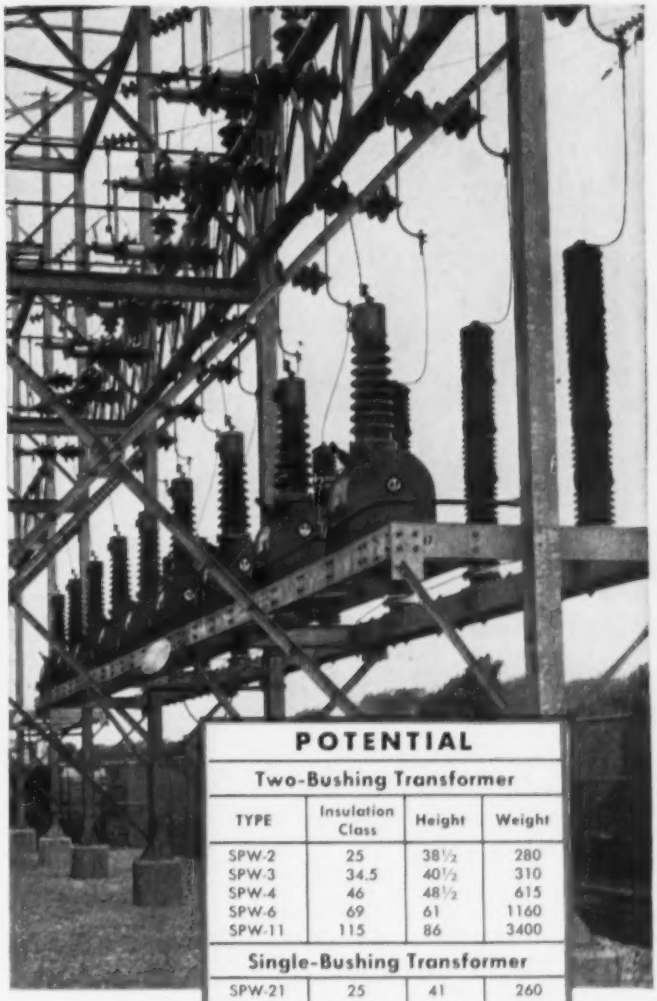
• **Line Material** Co. announces that construction on its new Visalia, Calif., plant is under way. It is supposed to be completed May 1, 1957. First production items from the plant will be L-M's line of Round-Wound distribution transformers. The building is costing about $1,250,000, and will have 65,000 sq ft of space.

• **Fluorescent Fixtures** of California announces the appointment of two regional sales managers, new positions, to coordinate activities of field engineers. **R. E. Liepold,** formerly assistant to the president, is now San Francisco regional sales manager. **M. J. Hooey,** former Seattle district field engineer, is now regional sales manager for the rest of the territories, including Pacific Northwest, southern California, Arizona, Midwest and Gulf districts.



So Light...SO COMPACT

So *Easy* to Install



MUCH smaller and lighter than previous designs, new Allis-Chalmers potential transformers cut installation costs and provide maximum handling convenience. Less space and less foundation to mounting structure are required. A fork truck or block and tackle is all that is needed to lift these 69-kv units into position. And, of course, relocating is accomplished just as easily.

Performance has also been improved in both ratio and phase angle with the advanced design of Allis-Chalmers potential transformers.

Many other design features — features that assure unparalleled dependability and long life — have been incorporated in these modern units. Get the complete story from your local A-C representative or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wis.

POTENTIAL

TYPE	Insulation Class	Height	Weight
Two-Bushing Transformer			
SPW-2	25	38½	280
SPW-3	34.5	40½	310
SPW-4	46	48½	615
SPW-6	69	61	1160
SPW-11	115	86	3400
Single-Bushing Transformer			
SPW-21	25	41	260
SPW-31	34.5	44¼	285
SPW-41	46	50¾	460
SPW-61	69	63¾	950
SPW-111	115	92	2310
SPW-131	138	112	3510

New Ratings have been added to the Allis-Chalmers line of potential transformers to include higher voltage insulation classes.

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

A-5164

Long

Delander

New Sales Organization Brings Sylvania Changes

Creation of a specialized sales organization for fluorescent lighting fixtures by Sylvania Electric Products has brought about several personnel appointments in the West.

Carl S. Long Jr. has been named lighting sales manager of the new Rocky Mountain district, with a new office at 4700 E. 48th Ave., Denver.

Roger J. Delander is Western area sales manager in the new organization, with headquarters at the new company facility at Burlingame, Calif.

J. Clayton Stephens is district sales manager, lighting, for the Los Angeles area. His assistant is Charles H. Connely, who joined Sylvania as a salesman in Los Angeles in 1953. Before that he was in lighting sales.

Thomas J. Holland is new district sales manager for lighting in the Seattle area, moving from Los Angeles. Under Holland is Garland R. Barlogi, recently promoted to district sales supervisor, lighting, in the Portland area.

• **Nat Blumberg,** who has supervised the Western sales force of Lightolier Inc. for the past three years, has been named vice-president in charge of West Coast operations. His headquarters are at the new Los Angeles office and showroom at 527 W. 7th St.

• **General Electric** has created a new operating department called the communications products department. Absorbing the functions previously handled by the communications equipment section, the new department takes over the company's communications equipment center at Redwood City, Calif. Department headquarters are Electronics Park, Syracuse, N. Y.

• **Tri-State Supply** Corp. is now exclusive distributor of New England Mica Co. sheet, tube and combination materials in the six Western states. Stock of the products is maintained at Seattle, San Francisco and Los Angeles.

• **J. C. Epperson,** San Francisco, is new warehousing representative for Keystone Mfg. Co. on the West Coast. The full line of Keystone wireways and electrical fittings will be carried.

• **James A. Wiggs** has been named sales representative at Phoenix for Kaiser Steel Corp. He will be head of the Phoenix office and serve customers throughout Arizona.

• **Fred W. Stokes** will handle Rodale Mfg. Co. wiring devices in the Washington-Oregon area. His headquarters are at 11509 Second Ave., N.W., Seattle 77.

• **NuTone** Inc., Cincinnati manufacturer of various electric accessories and appliances for the home, has constructed a new warehouse and office at 237 W. 30th St., Los Angeles. Expanding sales have caused the company to increase the size of the Los Angeles operation four times in the past five years.

• **Denver Engineering Sales** Co. is new regional sales representative for William Brand & Co., Connecticut manufacturer of insulating tubing, wire and cable. Colorado, Montana, Nevada, New Mexico, Utah and Wyoming are states in the territory. Denver Engineering's address is 2720 E. 3rd Ave.

• **R. A. Maynard** is transferring to the West Coast office of Pryne-Rittenhouse Sales Corp. at Pomona. He comes from Chicago where he was midwestern division sales manager.

Moulton

Weston Names Moulton Los Angeles Manager

Kenneth C. Moulton has been appointed manager of the new Weston Los Angeles branch office, which was recently officially opened with an open house reception for southern California industrial leaders.

Moulton comes to Weston from General Electric Co., where he has served as a design and field engineer and most recently as Los Angeles sales manager of supplies and apparatus for G-E Supply.

The new branch facility is a sales and service headquarters for the southern California area.

Executive Changes Made By Kaiser Corporation

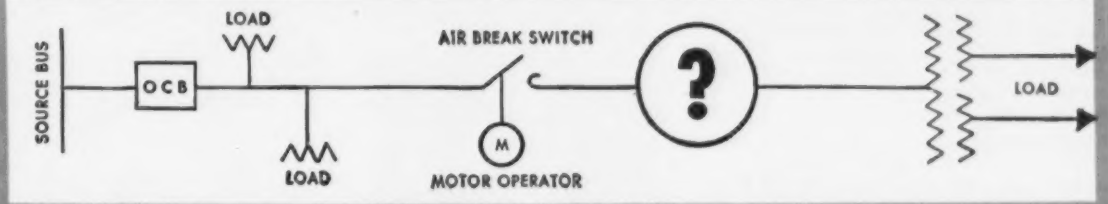
Kaiser Aluminum & Chemical Corp. has announced two major executive changes.

S. S. "Bert" Inch, formerly vice-president of Kaiser Aluminum & Chemical Sales, has been named vice-president and director of sales of the parent company.

John E. Menz, formerly general sales manager of Kaiser Aluminum & Chemical Sales, moves up to succeed Inch as vice-president and general sales manager of the sales company. He will continue to be located at the general sales offices in Chicago.

• **John E. Hogg** has been named Pacific regional manager of General Electric's industrial computer section. His office is located with the company's computer laboratory in Menlo Park, Calif.

HOW WOULD YOU PROTECT THIS TRANSFORMER?



SOUTHERN STATES TYPE HRS SAVES COST OF EXPENSIVE OIL CIRCUIT BREAKER

The problem presented in the schematic diagram above is to provide adequate internal fault protection for a power transformer. One solution would be to install a high side oil circuit breaker. However, this represents a large capital outlay—and, under many conditions, might not be justifiable.

The most practical solution would be to use the source breaker to clear the line should a damaging fault condition develop in the transformer; however, in the above case, transformer impedance is great enough to limit current to values below trip settings for the source breaker relays.

The answer is to install Southern States Type HRS Automatic High Speed Short Circuiting Switch. As soon as such a fault condition develops, the Type HRS, tripped by differential relays, imposes a deliberate ground fault on the line. The source breaker opens, clears the line, and the transformer is protected.

In order to isolate the transformer from the feeder, it is customary to install an air switch on the feeder between the short circuiting switch and the source breaker. Service continuity on the remainder of the feeder, after the HRS operates, can be maintained by providing the air switch with a spring or motor operator. Suitable under-voltage timing relays will automatically open the air switch before the first delayed reclosure. Service is then restored to the remainder of the line.

For a low capital investment and reliable protection, choose the Type HRS. Complete details are available in Bulletin 55HRS.

Available in Voltage Ratings of 34.5 KV through 161 KV and momentary current ratings of 20,000 amperes and a 4-second rating of 12,600 amperes.

SOUTHERN STATES EQUIPMENT CORP.
HAMPTON, GEORGIA

IN CANADA: Dominion Cutout Co., Ltd., Toronto

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PROFILES

Sayre Carlson Keyfauver Scott

Graybar's R. B. Sayre, vice-president of sales, New York, puts Arizona cowboy hat on Rube Carlson, transferred to Phoenix from Butte as B. F. Keyfauver left there to be sales manager for Sam Scott's district

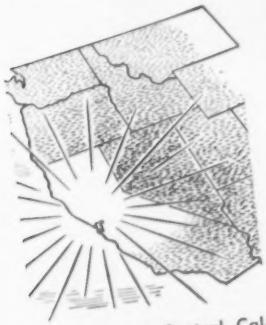
Constitution and by-law changes read to the Los Angeles Chapter, NECA, by Past President Herb Evans. President Andrew Hannon asked for action on each one. Hannan and entire board have been re-elected for 1957

Old-timers in the Los Angeles Electric Club were honored Nov. 19 by a special program in charge of Jim Shirreffs, who put derby hats on President George Larson and all of the committee. Old-timer Sheriff Eugene Biscailuz of Los Angeles County, who once worked for Los Angeles Gas & Electric Co., was principal speaker. He contrasted early days with present day law enforcement with the aid of much electrical equipment

Evans and Hanson

Jim Shirreffs George Larson Sheriff Biscailuz

Nuclear reactor facility at General Electric's new Vallecitos Atomic Laboratory, Pleasanton, California



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